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ORIGINAL ARTICLES.

APPENDICITIS.

Further Consideration of this Subject, with Tabulated Report of Cases not Previously Published.[1]

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IN order better to appreciate the trend of thought and practice on the subject of appendicitis at the present day, it will be greatly to our advantage to take a view of the work of the last five years. There has been no controversy in the history of medicine in which the struggle has been so intense between the surgeon and the physician as on that of appendicitis. Both parties have been honest in their convictions, and both equally positive that they are right. We naturally seek an explanation for this diversity of opinion as well as action, and the explanation is not difficult to discern. Differences of opinion as to the clinical course and probable results with operative and non-operative treatment have been almost entirely due to erroneous notions of the pathologic conditions.

Up to five years ago we had of the pathology of appendicitis practically no other but that of the post-mortem table; that has to-day been almost entirely superseded by the teaching of the operating-table. To-day we observe on the operating-table pathologic changes almost from the moment of their beginning until the destruction of the parts concerned is complete, whereas formerly we had deductions, and these very erroneous ones, from conditions that existed before the pathologic changes ensued which produced death. From results found post mortem we inferred the cause and course, and here was the source of error; to-day we observe the disease in the various stages of its progress from its inception to the final result. We are therefore preëminently qualified to arrive at a correct conclusion, inasmuch as our opportunities are so much greater for observing pathologic changes as they progress.

Now, on what points have the surgeon and the physician differed, and what has led to the diversity of opinion?

In 1888, when Kraft wrote his excellent monograph on appendicitis in *Volkmann's Vorträge*, it was the prevalent opinion of the profession all over the world that the vast majority of diseases in the sacro-iliac region were due to cecitis, an inflammation of the cecum or its surrounding tissues as a result of disease of that viscus, and it was variously known as typhilitis, perityphilitis, and cecitis.

Then, after Kraft's announcement, physicians gradually yielded point after after point until finally to day it is agreed that all except 2 per cent. of the inflammatory pathologic lesions about the caput coli are due to primary lesions of the appendix.

We may now regard the first point as practically settled.

The next argument advanced on theoretic considerations was that the appendix in inflammatory infections becomes swollen, and relieves itself by the discharge of its inflammatory products through its normal opening into the intestine, thus effecting a cure. What have we learned from observations at the operating-table? That in inflammatory lesions of the appendix the canal is rarely relieved of its inflammatory products in the way suggested, but is relieved by a necrosis of its wall and perforation. This is followed by the formation of an abscess and subsequent necrosis of the attached wall of the viscus to which it is adherent, the contents of the abscess escaping into the intestine.

The next contest was over the presence or absence of pus outside of the appendix in the majority of acute cases. Observation in operations has shown that in the acute stage pus is found outside of the appendix in 94 per cent. of the cases; that the existence of pus outside of the appendix does not demand a perforation of that organ for its production. That infection of the peritoneum and the formation of a peri-appendicular abscess may occur with an internal ulceration of the appendix and no perforation, I have shown by cases reported in the *Journal of the American Medical Association*, March 3 to 24, 1894. In that paper this pathologic condition was for the first time mentioned in the literature. While the profession was not prepared to believe that pus was present in the form of a circumscribed peri-appendicular abscess in practically all of the cases of acute appendicitis, it had been acknowledged for many years that in some cases

[1] Read before the Chicago Pathological Society, December 10, 1894.

abscess occurred around the caput coli, which emptied into the intestinal tract, and the patient recovered. We know now that this is the course in the very great majority of cases.

The last and final questions, and those on which the controversy is still spirited, are (*a*) the pathologic changes produced by perforation of the appendix into the peritoneal cavity; (*b*) the likelihood of that perforation, and also perforation of the circumscribed abscesses about it into the peritoneal cavity; (*c*) the immediate and remote symptomatic and physical manifestations of the latter, and (*d*) the ultimate result of such rupture.

The pathologic changes produced depend, first, on the character of the material admitted into the peritoneal cavity, *i. e.*, whether the contents of the appendix or abscess consist of (*a*) pus or débris in which the staphylococcus predominates; (*b*) whether the streptococcus predominates; (*c*) whether the bacillus coli commune exists in its virulent or inert condition, and (*d*) whether the pus, in which any or all of these may have existed, has become innocuous; second, on the quantity of material admitted at one time into the peritoneal cavity; and third, on the condition of the peritoneum at the time of admission of pus.

I have observed in patients, and demonstrated experimentally, that pus in which the staphylococcus and the inert bacillus coli commune predominated could be free in the peritoneal cavity for a long period of time, and produce but very slight changes in the peritoneum, *i. e.*, that the intestine may be bathed in pus of this character for days without excoriating the endothelium of the peritoneum. I have observed a pint of pus of this character in the peritoneum of a patient in whom the history showed conclusively that it must have been present for five days, and upon opening the peritoneal cavity the normal gloss of the peritoneum of the bowel was still maintained. I have taken this pus and produced cultures with it, which demonstrated its character, and injected one dram of the pus as removed from the peritoneal cavity into the peritoneal cavity of animals, both with and without mechanical abrasion of the peritoneum, without producing the least unpleasant symptom, and no pathologic lesions were found on making an autopsy.

In cases of general suppurative peritonitis, as a result of appendicitis, that have been under my observation, in which the normal glistening appearance of the peritoneum was present at the time of operation, the patients recovered, and inoculations of the pus into the peritoneal cavity of animals produced no unpleasant symptoms or lesions. When I find that the pus has not abraded the peritoneum, even though the surface of the latter has been covered with the former for a length of time, I consider the case a favorable one.

Note how this contrasts with the appearance in the abdomen when the streptococcus predominates. Here we find that, within a short time after rupture into the peritoneal cavity, the peritoneum in contact with the infectious material is entirely denuded of its endothelium, resembling the condition produced by a cantharides blister. The quantity of pus is always small, rarely exceeding a few drams, with here and there flakes of lymph. The bowel is distended and paralyzed; peristalsis has ceased. Inoculations with this pus produce the same condition; the red and angry appearance of the intestine I now recognize as a signal of the gravest importance, as, practically, all of my cases in which this condition was present terminated fatally.

The septic conditions due to the bacillus coli commune produce about the same physical manifestations as those of the streptococcus. The quantity of material discharged into the peritoneal cavity is of great significance; if it be small the intestines and omentum rapidly circumscribe it and protect the general peritoneal cavity from invasion. If it be large, and if it be irritating and poisonous, it may abrade the peritoneum of its endothelium as boiling water would, quickly, and be followed by a rapid absorption, causing death in a few hours. I have had only one case of this class, in which an abscess of considerable size ruptured into the peritoneal cavity. Within two hours the extreme symptoms of shock were present, and in twelve hours the patient succumbed. If a large quantity of pus of a low septic character be admitted into the peritoneal cavity it may remain in that cavity for days, and produce but slight changes. Finally, from some cause, this material, which had been innocuous, suddenly produces grave conditions and symptoms.

It is a matter of deep-rooted belief that a peritoneum that has been irritated repeatedly by the presence of a tumor, by the close proximity of an accumulation of infectious material, finally attains an increased resistance against infection, *i. e.*, the peritoneum of a patient who has suffered from the presence of a large and movable tumor will tolerate much more manipulation than a perfectly normal peritoneum, and that the peritoneum in the neighborhood of an old circumscribed abscess is more difficult to infect than a healthy peritoneum.

There has been a great difference of opinion as to the symptoms of appendicitis and the relation of the symptoms to the pathologic condition within. This diversity will continue until our power of differential diagnosis is very much increased. From a train of symptoms and signs in the early stage it is impossible to say just what is the exact pathologic condition. We can say, however, that it is a dis-

ease of the appendix in some stage of its development.

The symptoms of appendicitis are (1) a sudden pain in the abdomen; (2) shortly followed by nausea and, perhaps, vomiting; (3) local tenderness over the site of the appendix, and most frequently in the right iliac region; (4) elevation of temperature. These symptoms, occurring in this order, without a previous history of genito-urinary infection, or of a lesion of the gall-tracts, or Pott's disease, indicate with almost uniform regularity appendicitis. They do not indicate that the appendix is gangrenous, or that there is a simple catarrhal appendicitis. They do not indicate whether it has perforated or has not perforated; nor whether the cause is an infection with the staphylococcus, the streptococcus, or the bacillus coli commune, or the presence of a fecal stone, or of a foreign body. They do not indicate whether it is a stenosis of the appendix or an appendicitis obliterans, but merely that it is an appendicitis or acute disease of the appendix.

The physical manifestations, the presence or absence of induration, tumefaction, edema of the wall, tympanites, etc., aid in the differentiation of the various pathologic conditions present in the more advanced stage; but all of these are absent or comparatively worthless in the early stage.

The etiology, which was for a long time a subject of contention, is now practically agreed upon. It was very difficult to eradicate from the professional mind the deep-rooted erroneous belief that in a great majority of cases appendicitis was due to foreign bodies admitted into and retained in the appendix, as grape-seeds, cherry-stones, fragments of bone. Only 2 per cent. are cases with foreign bodies, and fecal stone in 38 per cent. To indicate the causes of appendicitis I will use the same classification employed in my article of March 3, 1893:

1. Simple pus-infection, producing the catarrhal variety.

2. Extensive infection by the bacillus coli commune or by pyogenic microbes, producing gangrene of a greater or lesser portion of the appendix.

3. Pressure-atrophy with infection of the appendix (*a*) by fecal concrement, and (*b*) by foreign bodies.

4. Retention-accumulations (*a*) from cicatricial contractions, stenosis, and obliteration, and (*b*) from occlusion by an enterolith or foreign body.

From the reports of autopsies collected I find that in 70 per cent. of the cases there were perforations of the appendix. Of my own cases in which the appendix was removed there was 87 per cent. Simple primary catarrhal appendicitis, if it exists, is rarely brought to the attention of the physician and still less frequently to that of the surgeon. Of 194 cases reported we had but one of this variety. A catarrhal inflammation in which the more serious form of appendicitis had previously existed is not uncommon.

The question of greatest practical importance to the surgeon and physician is the diagnosis. Can we determine when appendicitis is present, and can we determine the pathologic conditions that exist in the abdomen at any given time in the progress of the disease? To the former we must with positiveness answer in the affirmative; to the latter an equally forcible negative must be given; that is, we can say from the symptoms that a lesion of the appendix exists; but we cannot say, in most cases, how extensive, how dangerous, and how far-reaching the effects of that appendicitis may be, and still less can we say in any given case how soon the life of the patient may be greatly jeopardized by the disease which at the moment has apparently no grave danger.

If we were able to determine in the early stage, from the symptoms, physical signs or clinical history of a given case that it is going to take a favorable or an unfavorable course, we would regulate our treatment accordingly. Unfortunately, there are no symptoms present in the dangerous cases admonitory of their fatal termination until the patient has passed beyond the condition in which an operation offers reasonable hope of a recovery. The question to be answered is, When should we operate? The so-called conservative answers: "Operate on the collapsed cases; the cases that present symptoms of fulminating peritonitis; the cases that are taking an unfavorable course; the cases that appear to be progressing rapidly to destruction under medical treatment."

The surgeon must take a positive stand, and answer "No" to each of these rules. It is admitted that 50 per cent. of the fatal cases terminate before the end of the sixth day, many on the fourth, and a smaller number on the second. The surgeons who wait until the sixth day must, therefore, expect to have a mortality of 50 per cent. of all the cases that would die without operation. I believe the proper position for the true, earnest, and advanced medical man is expressed by the eminently scientific and truly conservative physician, Dr. Norman Bridge, in the following words: "Appendicitis is one of the most frequent and dangerous of the inflammatory diseases in or about the peritoneal cavity. We do not know the line between proper medical treatment and the demand for surgical interference, and I rather despair of finding it. The medical man is practically powerless to control the destiny of the patient. It is always a surgical disease, and the mortality should be materially lessened by skilful surgical treatment."

Would you delay operation on a case that is progressing favorably? By that I mean a case in which the temperature is not above 99°, the pulse not above 80, the expression good, the abdomen presenting no alarming signs? No; I have seen cases of this class go to the third, the fourth and the fifth day with all of the most favorable symptoms that could well be imagined, and on the sixth day die. From what? From a suppurative peritonitis that had existed all the time, as shown by the pathologic changes found in the peritoneum.

We have no sign, symptom or combination of signs and symptoms that indicate, with any degree of certainty, suppurative peritonitis in the cavity stage.

It may exist and the free peritoneal cavity contain drams of pus with a temperature of 99°, a pulse of 80, and a good facial expression. Note the following case that occurred in the practice of Dr. James G. Berry:

G. F., aged nineteen, weighed 220 pounds. On the morning of September 8th, after breakfast, he was attacked with a severe pain in the abdomen, followed shortly by vomiting, and the pain and discomfort were sufficient throughout the day to prevent the man from attending to his work. He remained about the same during the night, and the following morning at 10 o'clock, twenty-six hours after the onset of pain, he walked a couple of blocks to the drug-store and consulted the druggist concerning his trouble, who advised him to see a doctor, and he was seen by Dr. Berry at 3 o'clock, and the diagnosis of appendicitis was made. His pulse, when seen by Dr. Berry was 140, and temperature 102°. There was no tympanites; there was increased local tenderness over the region of the appendix; peristalsis was absent; the patient's countenance was good, and he expressed himself as tolerably comfortable. At 4 o'clock, assisted by Drs. Berry and McQuaig, I performed celiotomy. On opening the peritoneum pus flowed out. There were no adhesions whatever between the intestines; the appendix was free; a fecal stone protruded from an opening in the side of the appendix, where it produced pressure-atrophy perforation. The abdominal cavity was sponged; pus was found down in the pelvis; drainage was by gauze. The normal gloss of the intestine was not disturbed in the least by the presence of the pus, and the surface was not even red. The patient made an uninterrupted recovery.

It will be noted that the operation was performed thirty-three hours after the onset of the symptoms, and but a few hours after the patient had been walking in the street with a suppurative peritonitis. What would have been his condition if the operation had been delayed twenty-four or forty-eight hours? The answer is self-evident.

A retention-appendicitis, on the other hand, may produce a temperature of 105°, or even higher, enormous tympanites and a pulse of 140, an anxious facial expression, and all of the so-called classical symptoms of peritonitis, and the peritoneal cavity be free from infection. These are extreme pictures, but they occur.

When should we operate? As we are unable from the signs and symptoms to determine the exact pathologic condition, are we justified in allowing the probability of fatal conditions to continue for such a period of time without action as would place the patient beyond the possibility of rescue even by operative procedure? No! Until such time as the physician is able to determine the exact pathologic condition and danger in the individual case (and, indeed, we must now consider that time far distant), he is not justified at the peril of the patient's life in restraining the surgeon from acting. It must be conceded by all that an operative procedure, in competent hands, is in itself one involving very little risk, while the continuation of the pathologic processes in many cases greatly jeopardizes the life of the patient. There is only one safe position to take, and that is, in every case in which a diagnosis of appendicitis is made the operation should be immediately performed. It is true that many cases can recover without operation; but we cannot differentiate, in the early stages, which cases are going to be the favorable ones. It is further true that the earlier the operation is performed the less the danger to the patient and the greater the ease of removing the appendix. In a great majority of cases, if an operation be performed within forty-eight hours after the onset of the symptoms the appendix is not yet ruptured, and can be removed without pus-infection of the peritoneum, an advantage of which even the boldest surgeon is pleased to avail himself. The following case in the practice of Dr. J. H. Hoelscher is a beautiful illustration of this class:

Date of operation, November 10, 1894. Operator, Dr. J. B. Murphy with Dr. Hoelscher. Diagnosis, appendicitis.

Miss T., aged sixteen, was perfectly well up to 4.30 P.M. November 9th, when she was attacked with pain in the abdomen, which persisted and increased in severity, compelling her to go to bed. She began to vomit at 8.30 P.M., and vomiting and pain continued through the night and up to the time of operation. At 11.30 that night, when seen by Dr. Hoelscher, the temperature was normal. The diagnosis of appendicitis was made. At 8 A.M., November 10th, the temperature was 99.5°, the pulse 90; at 11 A.M., the time of operation, the temperature was 100°, the pulse 110. There was great tenderness over the region of the appendix; but insensitiveness in other parts of the abdomen. There was no tympanites; peristalsis was absent in close proximity to the appendix; the expression was good.

Operation was by the lateral incision. The appendix was covered entirely by visceral peritoneum adherent to the posterior surface of the cecum up on to the ascending colon. The end was enlarged

to half-an-inch in diameter, and contained no fecal stones, but was full of pus; gangrene of the mucous membrane was commencing; lymph-flakes existed in the outer wall of the appendix. The appendix was ligated and removed without rupture, the peritoneum sewed over, and gauze drainage inserted. The patient made an uneventful recovery.

In the later stage, if the surgeon is unfortunate enough to be called at that time, when the peritoneum is flooded with pus, and the patient in collapse, it is his duty to perform the operation and give the patient the advantage of the small percentage in his favor in this forlorn condition.

The rule, first, last, and always should be: Operate in every case of appendicitis, promising or unpromising, at the earliest possible moment. What operation shall we perform? The incision should be made a little toward the median line from the highest point of induration, parallel to the rectus; the muscular layer should be separated with the handle of the scalpel parallel to the course of the fibers, as advised by McArthur and McBurney, thus lessening the liability of hernia. The opening must be ample to allow the surgeon to perform the work within with ease. In the early cases the appendix should be removed, as the adhesions are friable and permit of the appendix being readily separated and drawn into the field. The parallel band of fibers on the cecum opposite its mesentery can always be followed to the position of the appendix, and is an infallible guide to its location. If the peritoneal cavity be opened before the abscess is reached, as is always desirable in the early stage, a thorough packing of gauze should be made around the induration to prevent the pus from entering the unaffected portion of the peritoneum. This I consider of very great importance, and I make an effort to enter the peritoneal cavity just to the side of the adhesions, so as to open the unaffected portion of the peritoneal cavity before I open the abscess; in that way the adhesions may be located, and the packing well placed, so as to thoroughly protect the peritoneum before the adhesions are torn.

In the later cases, that is, from the seventh day on, I consider it advisable to open directly into the abscess when adhesions are present, drain the abscess, remove the fecal stone, if one be present, and make no effort to remove the appendix. The appendix in the acute cases should be simply ligated with chromicized catgut; no effort should be made to top-sew it or bury it in the cecum. Occasionally there will be a fecal fistula, but that closes in a very few days itself.

In the cases of appendicitis operated on in the intermediate stage, *i. e.*, between the attacks, a cuff should be made of the peritoneum of the appendix, peeling the peritoneum back one-half inch or more; the muscular layers should be ligated and the cuff drawn back over the stump of mucous membrane and ligated. The pus should be carefully sponged out of the cavity, and no water or disinfecting solutions used; do not waterlog the peritoneum, as it is sufficiently taxed in taking care of the pus without this additional labor. A glass drain and a gauze drain should both be used in all cases in which pus is present at the time of operation or in which there has been a recent attack of appendicitis. The drain can be removed in eight or ten days, as the cavity fills up from the bottom.

This, in short, is an outline of the procedure I follow. All of the minor details cannot be mentioned here. There is no operation in the peritoneal cavity in which the patient's life is so completely in the hands of the operator, in which the errors of doing too much or too little work would be so likely to result fatally, as in the operation for appendicitis, with its multiform and complicated pathologic conditions. The result depends in a very great degree on the extent of the invasion, and the latter upon the period of time that has elapsed since the onset.

In speaking of results, I do not mean the results in recurring appendicitis, the simplest and least dangerous variety of all; I mean the results in all cases, from those of general suppurative peritonitis as a sequence of appendicitis, to those of the simplest catarrhal variety.

There is a growing tendency in the profession to shirk the responsibility of operating when the dangers are great, *i. e.*, to defer operation on the most dangerous cases and advocate operation on the obliterated or stenosing recurrent varieties in which there is the least danger to the life of the patient from the disease. We must not swerve from our obligations to our patients, but should make every effort to rescue them regardless of the praise or condemnation bestowed upon us.

In reporting cases it is the duty of every operator to classify or mention in detail the important or common symptoms of each individual case in a tabulated form, and give an abstract of the history and pathologic conditions, that the analytical mind in reviewing the results obtained by individual operators may be able to explain the cause of success or failure when the operator himself is not able to do so. It is, therefore, the duty of every surgeon in writing on this subject to give sufficient details of his cases to enable the reader to judge whether they were of the grave or mild variety; whether they were all cases of recurrent, simple, adhesive appendicitis, or whether many of them were of the gangrenous, perforative, and malignantly infectious variety, with the peritoneum extensively involved.

I shall endeavor to give a short outline of the

various conditions found in operating for appendicitis.

1. When the abdominal wall is infiltrated, and the abscess is opened without opening the unaffected portion of the peritoneum, there may be (*a*) a small circumscribed abscess, with the appendix forming part of the wall; (*b*) a small abscess, with a tract leading to a larger abscess more deeply; (*c*) a large abscess filling the iliac fossa, containing fecal concretions, or a gangrenous appendix floating in the pus, all closed in with firm adhesions. (This condition never exists in the early stage, and in this class of cases the adhesions protecting the peritoneum should never be broken to remove the appendix.) (*d*) There may be multiple abscesses, with no connecting sinuses. This is a comparatively rare condition. In one of my cases a second abscess was not opened, and the patient died of pyemia four weeks later. (*e*) There may be an abscess in the opposite side of the abdomen; it usually appears in the same relative position, to the left anterior superior spinous process, as the abscess does to the right. There is no connecting sinus. It never occurs in early cases, and is more commonly found a week after operation and three or four weeks after the onset of attack, and should be opened and drained.

2. In another class of cases, when the peritoneum is opened and no adhesions to the anterior abdominal wall are found, a circumscribed abscess may be found situated on the posterior wall of the abdomen, the appendix and pus surrounded and walled in by adherent omentum and intestine. This is the most common condition found in the early stage. The location of the abscess may be near the median line near the margin of the pelvis, close to the crest of the ileum, over the kidney posterior to the cecum, or on the margin of the liver, as in two cases. The occurrence of a suppurating appendix on the surface of the liver or adherent to its margin is due to the congenital deformity and malposition of the cecum, so perfectly described by Cushmann, and the distention of the colon with gas does not aid in making a differential diagnosis between appendicitis and cholecystitis. Still, the most frequent location for the appendix is in the neighborhood of the McBurney point. The exact position of the appendix can be found by following the white fibrous bands along the convex surface of the cecum to the base of the appendix. In all of these cases the field of operation should be thoroughly protected by carefully packing with strands of iodoform-gauze, retaining the ends outside. The adhesions are separated, the pus sponged out, and the appendix liberated from its adhesions; a ligature is then placed on the appendix, and one on its mesentery. In all the cases in which the peritoneal cavity is opened directly the appendix should be removed. When the appendix is situated above and behind the cecum, in close proximity to the liver, the induration can be detected behind the cecum, and must be reached by pressing the cecum forward, packing around, and opening the abscess, locating the appendix, and removing it.

3. When the abscess is circumscribed in the pelvis, and the appendix is found hanging over the brim, or attached to the uterus, the tubes, or the ovaries, the appendix is located by following the bands on the cecum; pus should be sponged out, the appendix amputated, and a long glass drain inserted.

4. In another class of cases the peritoneal cavity will be found to contain a large quantity of free pus with no limiting adhesions, and the bowel may be smooth and glossy, not in the least congested or eroded of its endothelium. All of these cases recover. On the other hand, the bowel may have a livid, blistered appearance, entirely excoriated of its endothelium, and very much distended, showing a paralysis of its muscular walls. The great majority of such patients die. In either of the cases stated the appendix may be adherent or free; it is usually perforated and gangrenous. In both, the appendix is located by the fibrous bands on the cecum or by the sensation to touch by its swollen, hard, and enlarged condition; it must not be confounded with the indurated omentum. Extensive drainage, both of glass and gauze, should be employed, and no irrigation.

5. We find a class of cases in which there is a small quantity of pus located around the appendix, with partial adhesions protecting the peritoneum, and with flakes of lymph extending some distance. This condition may be caused by a perforation of the appendix; by gangrene of the mucous membrane, local or general, without perforation; by a simple ulcer of the appendix without perforation; by accumulation and retention of muco-purulent material in the appendix, with only an abrasion of the mucous membrane of that organ.

6. Specific ulcers in the appendix without perforation or infection of peritoneum, as (*a*) tuberculous, of which I have had one case with recovery; (*b*) typhoid, three cases, all recovered. Both of the latter conditions produced all the acute symptoms—pain, vomiting, tympanites, and elevation of temperature. In these cases, when the appendix is located at the time of operation, it will be found very much enlarged at the seat of ulceration, with the distal end distended with accumulation.

7. There is a class of cases in which the canal of the appendix is partially or completely obliterated or stenosis of the canal is produced sufficient to cause retention of material in the distal end, causing recurrent attacks. In one of the cases of this kind

Number of case.	Date of operation. (1894.)	Name, sex, and age of patient.	Operator.	Number of attacks before operation.	Ulcerative appendicitis.	Gangrene of appendix.	Perforation of appendix.	Tuberculosis of appendix.	Appendix non-adherent.	Appendix adherent	Enterolith.	Time of operation after attack (days.)	Recurrence after simple drainage.	Rupture of abscess into urinary bladder.	Circumscribed abscess; peritoneal cavity not opened.	Abscess intra-peritoneal; peritoneal cavity opened.	Septic peritonitis without limiting or with incomplete limiting adhesions.	General septic peritonitis with no adhes.	Gen. sept. perit. with incomplete adhes.	Rupt. of dicum, absc. into perit. cavity.	Appendicisectomy during attack.	Appendicisectomy between attacks.	Fæcal fistula.	Fatal sapremia.	Recovery.	Death; hours after operation.	Sudden pain in abdomen.	Nausea or vomiting.	Local tenderness (increased).	Temperature.	Dry septic peritonitis.	Abscess-cavity comm'cating with bowel	Remarks.	Case referred by
146	May 18	J. T., M. 50	M.	3	...	...	...	...	...	x	...	10	...	...	x	...	...	...	...	...	...	...	...	...	...	x	...	...	x	100	...	...	Abscess close to liver, behind colon.	Dr. Thometz.
147	" 24	C. C., M. 36	"	3	...	...	...	...	...	...	...	11	...	...	x	...	...	...	...	...	...	...	...	...	...	x	...	...	x	99½	...	...	.....	" Piper.
148	" 26	Mrs. T., M. 28	"	...	x	x	...	...	...	x	...	11	...	...	...	...	...	x	...	...	...	...	...	...	...	x	...	...	x	103	...	...	Moribund at time of operation; did not rally.	" Neal.
149	" 28	L., W. P., M. 56	"	...	...	...	...	...	...	x	...	9	...	...	x	...	...	...	...	...	...	...	...	...	...	x	...	...	x	99.6	...	...	.....	" Schmidt, Otto.
150	" 28	L. W. P., M. 21	"	1	...	...	...	...	x	...	...	2 y	...	...	...	...	...	...	...	...	...	...	...	...	...	x	...	...	x	97.6	...	...	Patient in sixth week of typhoid; died two weeks later sup. peritonitis. Post mortem; seat of operation on appendix perfectly healed. Peritonitis from typhoid ulcer not perforated.	" "
151	June 1	O'H., M. 24	"	...	...	x	...	...	...	x	...	5	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	101	...	...	.....	" Conley, T. J.
152	" 4	A. M., F. 27	"	5	...	x	...	...	...	x	...	3	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	101	...	...	Abscess so small could not be located before operation.	" Conley, P. H.
153	" 10	W., M. 40	"	...	...	x	...	...	...	x	...	4	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	101	...	...	Patient a tippler; extremities cold, and pulse weak before oper'n.	" Rohr.
154	July 6	W., M. 50	"	...	...	...	...	...	...	x	...	4	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	99	...	...	Bowels excoriated; gloss absent.	" Conley, P. H.
155	" 6	A. L., M. 26	"	...	...	...	...	...	...	x	...	14	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	...	...	x	Abscess had opened into bowel previous to operation.	Alex. Bros. Hosp.
156	" 8	O., M. 45	"	...	...	...	...	...	...	x	...	8	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	99½	...	...	.....	Dr. Conley, T. J.
157	" 9	G., M. 22	"	...	...	x	...	...	...	x	...	4	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	99	...	...	Patient's extremities and facial expression very bad at time of [operation.	" Thometz.
158	" 19	L. G., M. 16	"	1	...	x	...	...	...	x	...	9	...	...	x	...	...	...	...	...	...	...	...	...	...	x	...	...	x	100½	...	...	.....	" De Wolf.
159	" 23	T., G., M. 19	"	1	...	x	...	...	...	x	...	3	...	...	x	...	...	...	...	...	...	...	...	...	...	x	...	...	x	101	...	...	Same as case No. 101 in previous report.	" Jennings.
160	" 24	G., M. 18	"	...	...	x	...	...	...	x	...	4	...	...	x	...	...	...	...	...	...	...	...	...	...	x	...	...	x	...	...	...	.....	Alex. Bros. Hosp.
161	" 25	C., M. 28	"	...	...	x	...	...	...	x	...	7	...	...	x	...	...	...	...	...	...	...	...	...	...	x	...	...	x	...	...	...	Abscess situated under border of liver and over kidney.	Dr. Verity, W. P.
162	Aug. 2	S., F. 16	"	...	...	...	...	...	...	x	...	2	...	...	x	...	...	...	...	...	...	...	...	...	...	x	...	...	x	104	...	...	Appendix very much enlarged; typhoid ulcer.	
163	" 7	McG., F. 42	"	2	...	...	...	...	...	x	...	...	...	...	x	...	...	...	...	...	...	x	...	...	...	x	...	...	x	...	...	...	Canal in appendix entirely obliterated.	[ford.
164	" 17	R. S., M. 50	"	5	...	...	...	...	...	x	...	...	...	...	x	...	...	...	...	...	...	x	...	...	...	x	...	...	x	98.4	...	...	Chill; very large abscess.	Dr. Riching, Rock-
165	" 24	A. S., M. 22	"	5	...	...	...	...	...	x	...	...	...	...	x	...	...	...	...	...	...	x	...	...	...	x	...	...	x	...	...	...	Drainage; rapid convalescence.	Hadsel, Elgin, Ia.
166	Sept. 4	M. D., F. 6	"	...	...	x	...	...	...	x	...	...	...	...	x	...	...	...	...	...	...	x	...	...	...	x	...	...	x	...	...	...	Enterolith very large.	" Cullin.
167	" 4	J. C. K., M. 35	"	2	...	x	...	...	...	x	...	10	...	...	x	...	...	...	...	...	...	x	...	...	...	x	...	...	x	100	...	...	.....	" Whitford.
168	" 5	W. B., M. 14	"	...	x	x	...	...	...	x	...	5	...	...	x	...	...	...	...	...	...	x	...	...	...	x	...	...	x	99.5	...	...	Peristalsis present. Normal gloss on intestine notwithstanding [pus all over.	[(Niles.)
169	" 9	A. J., M. 20	"	...	x	x	...	...	...	x	...	6	...	...	x	...	...	...	...	...	...	x	...	...	...	x	...	...	x	103.6	...	...	Appendix situated over spine at brim of pelvis.	Alex. Bros. Hosp.
170	" 9	F., M. 19	"	...	x	x	...	...	...	x	...	33 h	...	...	x	...	...	...	...	...	...	x	...	...	...	x	...	...	x	102	...	...	Pulse 140 at time of operation; peristalsis absent. Appendix opened into cavity without adhesions.	" Berry, J. G.
171	" 11	B., F. 11	"	...	...	...	...	...	...	...	...	7	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	99½	...	...	.....	" Idbert, Indianapolis
172	" 13	M., F. 14	"	...	...	...	...	...	...	...	...	10	...	...	...	x	...	...	x	...	...	...	...	...	...	x	...	...	x	103	...	...	Had chill before operation; great pain and tenderness follow- ing. Peritonitis continued till death.	" Riley and Berry.
173	" 22	D. D., M. ...	"	11	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	x	...	...	x	...	...	...	.....	" Conley.
174	" 22	A. E., M. 28	"	1	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	x	...	...	x	101.5	1	...	Worried with pain and tenderness up to day before operation.	" Thometz.
175	" 26	G. T. H., M. 24	"	1	...	...	...	...	...	...	...	6	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	103	...	...	Peristalsis absent; ap. gangrenous; not perfor., 1 oz. pus around [appendix.	" James G. Berry.
176	" 27	A. H., M. 8½	"	...	...	...	...	...	...	x	...	4	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	100	...	...	absent; ap. gang.; perforated.	" Pigall.
177	Oct. 14	J. C., M. 18	"	...	...	...	...	...	...	x	...	9	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	...	...	...	.....	" Harrigan.
178	" 16	J. E., M. 37	"	1	...	...	...	...	...	x	...	21	...	x	...	...	...	...	...	...	...	...	...	...	...	x	...	...	x	98.4	...	...	present; " two perfor.; abs. opened into bowel; prev. opr.	" G.
179	" 21	B. P., F. 21	"	12	x	...	...	...	...	x	...	36 h	...	...	...	x	...	...	x	...	...	...	...	...	...	x	...	...	x	100.5	...	...	absent; " covered with flakes of lymph. [1 yr. for abs.	" R. Connell.
180	" 23	B. P., M. 27	"	1	1	2	...	...	...	x	...	7 d	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	101.7	...	...	present; " gang. at enterolith; 2 perfor. located around abd.	Alex. Bros. Hosp.
181	" 30	M. P., F. 16	"	10	...	9	...	...	...	x	...	...	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	101	...	...	" in center; easily shelled out. [wall.	Dr. I. C. Herb, P. G. H.
182	Nov. 6	R. A., M. 24	"	7	...	...	...	...	...	x	...	15 h	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	...	...	...	" obliterat'd in 2 places, one at junc. of cecum.	" Bridge, St. Jos. "
183	" 8	C. B., M. 31	"	...	...	...	...	...	...	x	...	5 d	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	103	...	...	" gangrenous; much pus; bad expression.	" McQuaig.
184	" 10	M. T., F. 16	"	1	1	...	...	...	...	x	...	18 h	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	100	...	...	in mucous mem. not perfor. and removed without rupt. full of pus.	" J. H. Hoelscher.
185	" 20	C. E., M. 28	"	...	1	1	...	...	...	x	...	3	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	99.8	...	...	absent; " part. gang. and perfor.; endothelium exfoliated; bowel red, blist.; 2 oz. pus, gauze and glass drain.	Cook County Hosp.
186	" 25	P., M. 10	"	...	1	1	...	...	...	x	...	8	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	99.6	...	...	" part. gang.; abscess completely circumscribed.	Dr. Linden.
187	" 26	B., F. 9	"	...	...	...	...	...	...	x	...	14	...	...	x	...	...	...	...	...	...	...	...	...	...	x	...	...	x	98	...	...	" abscess opened and drained.	" Scholler.
188	" 26	P., M. 22	"	...	...	...	...	...	...	x	...	9	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	100	...	...	..... [about 1 oz. pus.	" Symon.
189	" 30	W. K., M. 10	"	1	...	...	...	...	...	x	...	90 h	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	100	...	...	" gangrenous; pin-hole perfor.; large enterolith;	" Hoelscher.
190	Dec. 6	T., M. 17	"	1	...	...	...	...	...	x	...	8	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	102	...	...	" located over promontory or sacrum several inches from abdominal wall; packed well and opened.	" Jennings.
191	" 6	M., M. 16	"	3	...	...	...	...	...	x	...	8	...	...	x	...	...	...	...	...	...	...	...	...	...	x	...	...	x	100	...	...	Very large abs. most prominent in left side; opened extra-peritoneal; pus like tuberculous debris.	Alex. Bros. Hosp.
192	" 8	E., M. ...	"	...	...	...	...	...	...	x	...	10	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	99.6	...	...	Large abscess not adherent in front; appendix very [firm and allowed to remain.	Dr. Eads.
193	" 10	B. S. O'C., M. 52	"	3	...	...	...	...	...	x	...	...	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	98.8	...	...	Appendix infiltrated, dense; mesentery ⅛ inch thick, also infil- trated and cut off where the ligature was tied; mucous mem- brane ecchymotic and swollen; appendix firmly adherent to cecum; could not be bent upon itself without breaking.	" Dinnen, Fort Wayne.
194	" 15	J. T. S., M. 25	"	1	...	...	...	...	...	x	...	23 h	...	...	...	x	...	...	...	...	...	...	...	...	...	x	...	...	x	102	...	...	Wall of appendix very much enlarged; full of pus; mucous membrane gangrenous; ready to perforate.	

there was a fecal stone entirely surrounded by connective tissue, the mucous membrane having been completely destroyed and the canal obliterated in a previous attack; there were no adhesions around the appendix. In many other cases portions of the canal were found obliterated, and in others a stenosis or narrowing of the canal; the latter is the most annoying variety, as there are frequent recurrences of attacks, and the patient is rarely ever free from pain or sensitiveness in that region. As far as I can learn from the literature, the credit belongs to Dr. Henry O. Marcy, of Boston, for being the first to perform the operation of appendicisectomy in the intermediate stage for the relief of this class of cases. The operation was on Dr. Samuel B. Nelson, November 9, 1886, and the report was published in the *Boston Medical and Surgical Journal* at that time. The patient recovered, and left the hospital in eighteen days.

8. *Appendicitis stercoralis.* In this class of cases there is a large accumulation of feces surrounded by mucous or muco-purulent secretion. The attacks of pain are severe and recur frequently. They are usually accompanied by a temperature not exceeding 100° or 100.5°, and vomiting is a very pronounced symptom. The attack resembles one of intestinal retention, as frequently a movement of the bowels cannot be produced for four or five days. The cause of the symptoms of intestinal obstruction has not been clearly explained, but I believe them to be reflex phenomena, as we find exactly the same condition produced in obstruction of the ductus cysticus with gall-stones. The appendix in cases of this kind is very much enlarged at the distal end, small at the proximal end; its mucous membrane is thickened, and it contains a large quantity of hardened feces.

The mortality in my cases, including all grades, and operating on every case of appendicitis, favorable or otherwise, which came under my observation, is 9.6 per cent. The total number of cases operated on to date is 194. The table on the preceding page is a tabulated form of the cases operated on since my publication, March, 1894.

In the literature of this subject I wish to call attention particularly to the contributions, each presenting various phases of the disease to greater advantage than the other, of Kraft, McBurney, Maurice Richardson, Bryant, Shrady, Wyeth, Sonnenburg, Robert T. Morris, Senn, and McArthur.

A Sign of Intestinal Occlusion Due to Incarceration or Torsion.—At the recent French Congress of Surgeons, GANGOLPHE (*La Méd. Mod.*, No. 83, p. 1292) called attention to the occurrence of a sero-sanguinolent effusion into the peritoneal sac in cases of intestinal occlusion due to strangulation or torsion. He considers the detection of this sign as an urgent indication for immediate surgical interference.

SOME PRACTICAL SUGGESTIONS ON THE TREATMENT OF WOUNDS.

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MY object is to offer some practical suggestions, deduced from personal observation, and with special reference to the kind of wounds that occur in the cases colloquially classed as emergency cases.

In *wounds of the scalp*, after carefully preparing the hands, the first steps in treatment are the shaving of the neighboring field and thorough irrigation of the wound with a heated 1 : 2000 solution of mercuric chlorid, using from four to sixteen fluid-ounces. All foreign bodies should be removed, and the wound should be explored with the finger carefully, seeking the extent of the injury and the amount of damage done to the periosteum or bone. Then further irrigation of the wound with the warm mercuric-chlorid solution should be practised. This, in a measure, will check oozing.

The next step is the control of hemorrhage, which is often profuse, owing to the extreme vascularity of the parts. By following up with a hemostat, a sterilized cotton or gauze sponge wrung out in the mercuric-chlorid solution, the bleeding point or points can generally be located and controlled. This is the most satisfactory mode, and should always be practised in preference to such unskilful and awkward procedures as continued compression (often followed by sloughing), and the uncleanly filling of wounds with substances or solutions having hemostatic properties. Twisting the smaller vessels will satisfactorily close them, but the larger ones must be ligated. Silk is always attainable, is strong and safe, and can be readily sterilized by immersion in boiling water, and hence offers the best ligature-material in the cases under discussion.

The next step is the approximation of the edges of the wound. Although I have never seen sutures, properly applied, used in a scalp-wound to a disadvantage, we may consider them dispensable when there is little gaping, rendering the wound less liable to infection, should there be any laxity in the antiseptic precautions.

As to suture-material, silk again is always readily obtained and easily sterilized, and offers the best all-round material we have. Horse-hair kept in a mercuric-chlorid solution is the most satisfactory suture; but in an urgent case is not always at hand.

The interrupted suture is the best in scalp-wounds, as good apposition can always be obtained. It can be tightened without causing undue puckering, thus mechanically checking any oozing. It is easily removed. I have often tried the subcutaneous suture, but without as good results as with the interrupted. If there is little gaping, as when the wound

is in the direction of the muscle-fiber, it can always be dressed, and sufficient coaptation secured either by adhesive strips over sterilized gauze or by some form of collodion dressing. When sutures have been necessary the best dressing is that of collodion, either with iodoform or carbolic acid, or simple collodion. The collodion can be readily removed, even even if tightly adherent, by the application of ether. In three or four days the sutures should be removed and the wound again covered with collodion, giving instructions to the patient to let it wear off.

Bandages can usually be dispensed with, and only in cases with much laceration and contusion are they at all necessary. They are most inconvenient, and many cases of persistent headache are directly attributable to their unnecessary application. The continued compression of a bandage too often exerts a deteriorating influence on the healing-process, and may cause sloughing of the part. Owing to extreme vascularity wounds of the scalp heal readily, show little tendency to slough, or to become infected, except when treated under primeval methods.

If digital examination shows the periosteum to be injured, or its continuity broken, it should be united by a continuous suture of fine silk. If there is much denudation of the bone and overlying tissue the wound should be left open and allowed to heal by granulation, as there is likely to be necrosis and exfoliation of the bone.

The most satisfactory dressing in cases like this is one of iodoform-gauze covered by successive layers of wet mercuric-chlorid gauze, over which is placed a piece of mackintosh to retain the moisture, thus rendering the wound constantly safe from infection, and thus dispensing with continued irrigations, which are extremely painful to the patient. It is hard to conceive of a case, particularly in urban practice, in which a mercuric-chlorid solution, some silk and boiling water are not readily obtainable. These are the sole requisites for aseptic treatment, and with them pus is almost unknown in the healing-process. With these simple precautions the formerly common abscesses of the scalp and their possible frightful results, together with erysipelas, etc., will be eliminated. In fact, in my experience at the Emergency Hospital, where wounds are received under the most unfavorable conditions, often many hours old, I have never seen a case of extensive suppuration beneath any of the several layers covering the cranium.

Wounds of the face are annoying on account of the frequent subsequent disfigurement due to cicatrization or scarification. In suturing wounds about the eyelids the closest apposition should be obtained and the finest suture material used. The sutures should not be tightened, as the slightest puckering about the eye will produce a decided deformity. The tissues of the face are very vascular, and the continuous or subcutaneous suture can be used to an advantage.

Wounds involving the buccal mucous membrane are also prone to produce marked disfigurement, and in suturing, the object is to unite the mucous membrane in such manner that the dividing pink line on the lips shall be maintained in regular continuity. It is of course difficult to keep these wounds clean and aseptic, owing to the entrance of particles of macerated food and saliva, but fortunately the results of such infection seem to be of little consequence, and we can always expect these wounds to do well. Potassium permanganate and hydrogen dioxid are frequently used with seeming benefit as mouth-washes. Attention to the anatomic distribution of the arteries of the scalp and face will always be of advantage, as they are all superficial and can be controlled temporarily by digital compression until a hemostat can be applied.

In extensive wounds of the face one must be wary of subsequent facial palsy, due to severance of the branches of the seventh nerve, and warn the patient of its frequency; thus relieving himself of unjust blame.

We must frequently trust much to granulation and not attempt to draw portions of the surviving tissue together, often with the result of producing marked deformity. A subsequent skin-graft is often of service after granulation is well advanced. If there is much contusion or laceration of the tissues warm boric fomentations are advisable.

Continued boric fomentations offer the best treatment for what is commonly known as black eye. There also seems to be an anodyne property in the heat conveyed to the part in this manner, besides its usefulness in materially reducing inflammation.

The only point I wish to emphasize in treatment of *wounds of the upper extremity* is to avoid compression by bandages, particularly about the elbow-joint, where much swelling must be expected after contused wounds. Circular compression is always dangerous to a limb, and, if a bandage must be applied, the application should be made over two splints, diametrically opposite, thus utilizing lateral compression only. One should search always for the ends of divided or severed muscles, tendons, and nerves, and under no circumstances close a wound until the ends have been united, as retraction is constantly taking place, thus rendering the union more and more difficult. Here again we should use copious irrigation of the warm mercuric-chlorid solution, and, if there is much laceration and contusion, the wet dressing.

In the treatment of *wounds of the fingers* there is seldom any occasion for immediate amputation.

We should save as much tissue as possible, dress the injury with wet mercuric-chlorid dressing; then, after several days, if the extremity shows no signs of vitality, the question of amputation may be considered, although it has been my plan to allow the dead tissue to slough off and the wound to heal by granulation. While this is not a clean, neat procedure, it is entirely safe under strict antiseptic precautions, and invariably saves tissue that is of incalculable value in the case of the fingers. I have had a case of complete severance of a finger by a bread-cutter, and have united the severed portion to the stump by silk sutures, and in a short time had complete restoration of the part. Several of my medical friends have cited similar instances, and I mention them here to impress the value of economy of tissue. It must be remembered that under new methods the old bugaboos of surgery—gangrene, erysipelas and pyemia, are relics of the past, and that in a case like that stated, if satisfactory union did not take place there would be plenty of time for amputation of the vitalized part after several days of observation.

In stab-wounds, or, in fact, in any penetrating *wounds of the chest or abdomen*, the surrounding cuticle should be immediately shaved and scrubbed with mercuric-chlorid solution, and a large, bulky dressing of mercuric-chlorid gauze and sterilized cotton applied. Then, if entrance into either of these cavities is deemed advisable, it can be done safely and in a short time. It is well not to probe here, as the mere act of probing discloses little and may disturb an all-important clot or introduce sepsis.

The same admonition may be made in regard to immediate irrigation, which may disperse a clot and start an alarming hemorrhage which is not easily controlled as in the former instances. We should always strap the chest in wounds of any kind in that locality, and strive to keep the respirations down with successive doses of morphin. It is also well to apply an abdominal binder in wounds of the abdomen and to keep the patient in a supine position. All treatment in this kind of cases is expectant, as any alarming symptoms indicative of internal hemorrhage demand active operative interference. It is well to bear in mind the possible occurrence of secondary hemorrhage, which may happen at any time during the first fortnight, during which time the patient should be kept quiet and treated expectantly.

To summarize: We rely much on the fixation of the chest by adhesive straps, or even by a plaster jacket in wounds of any nature about the thoracic cavity, and likewise with the binder in abdominal cases.[1]

[1] The wisdom of this limitation of respiratory movements is demonstrated in a case of rupture of the lung which I reported in THE MEDICAL NEWS, February 24, 1894.

Transfusion is seldom of any avail after the occurrence of extensive hemorrhage, and should be practised only with great caution. External heat by water bottles, or by heated blankets, hypodermic stimulation by strychin sulphate to a maximum of gr. $\frac{1}{10}$, ergot, brandy, digitalis, ammonia, etc., autotransfusion by bandaging the extremities, and rectal injections of a warm saline solution will generally suffice and exert none of the untoward or dangerous effects of the transfusion. It is when these procedures prove of no avail that operative interference is peremptorily demanded, as therein lies the only hope of avoiding a fatal issue.

Bullet-wounds of the extremities should always be thoroughly irrigated and packed with an iodoform-drain, making the drainage complete from the wound of entrance to that exit, if possible. Hemorrhage is not an important factor in bullet-wounds, as the elastic bloodvessels generally escape injury. When, however, there is severance of a bloodvessel it must be sought for or dissected out and ligated. As it may be the main vessel of the limb, the pulse should always be sought below the seat of injury; its absence indicates stimulating treatment, to maintain the vitality of the member, and expectant preparation for amputation if sufficient anastomosis is not established. Here, also, all muscles, tendons, and nerves, should be united as soon as discovered, which may not be till use of the member is attempted.

Relative to the bullet itself, I think we should never make any extraordinary effort to locate it. If, after ordinary probing, it is not discovered, the wound may be allowed to heal by granulation, and if it causes any subsequent trouble, the pressure, pain, etc., will locate it, and it can be readily removed after the original wound has entirely healed.

If signs of suppuration are prominent in the injured member, free incision along the suppurating tract should be made and open drainage established. This, together with the wet mercuric-chlorid dressing or antiseptic fomentations constantly applied, will usually suffice, and amputation for suppuration in a bullet-wound should be a very rare indication. Administration of quinin and stimulation are always indicated to offset the entrance of sepsis systemically.

A limb should always be splinted in which there is an extensive wound of any kind, thus gaining fixation of the parts, and markedly augmenting the efforts toward restoration. In the furtherance of this we need to remember to make the splints wide enough to avoid circular compression. Elevation of the affected member will always ameliorate pain and lessen hemorrhage. The possibility of secondary hemorrhage must again receive consideration.

In treating poisoned wounds the points to be borne in mind are the relief of pain and swelling,

which are temporarily severe, and the antidotal treatment of the poison. Anodyne preparations and ammonia-water are efficient in insect-stings. The application of either warm fomentations, or, what seems better, cracked ice, will be sufficient to reduce the swelling.

Most venom has been shown to be a decidedly cardiac depressant, and its effect is probably due to a process similar to ptomain-poisoning; hence the use of the intermittent ligature in *snake-bite*, to allow the entrance of the poison gradually, by which means the leukocytes and other like constituents of the blood can combat it successfully, and not be suddenly overcome by it. Stimulation to excess by means of alcohol (always at hand), strychnin, digitalis, strophanthus, or nitro-glycerin, should be practised, and the wound cauterized or excised.

Surcharging the blood with oxygen by inhalations of the pure gas, or by hypodermic administration of some readily deoxidizable substance as potassium permanganate, is a method worthy of trial.

The idea of any one specific as efficient in these cases of venomous bites is unworthy of comment, as the treatment must be conducted on the general principles laid down by observance of the physiologic action of the venom.

In treating *animal bites*, when there is a distinct wound observable, antisepsis should be prominent. The cautery, actual or chemic, is demanded. Many cases reported as hydrophobia are merely examples of general systemic infection from a local focus of sepsis, made possible by some primitive and uncleanly treatment of the original wound. With but few exceptions all such wounds under my observation have been filled with the hair of the dog, soot, ham-fat, and particles of decayed food, and saliva from the mouth of some person who has practised sucking the wound. This is the result of superstition among people presumably intelligent.

The medical consultant should always treat this kind of wound as any other, and be rigid in irrigation and antiseptic dressing.

A word regarding suppurating wounds of long-delayed union. I have found that after using the ordinary stimulating applications without avail a solution of zinc chlorid, forty grains to the fluid-ounce of water, will bring about the desired effect. In making the application of this solution to the suppurating or sluggish tract or cavity, all the neighboring healthy tissue should be carefully protected from its caustic action.

In a case of laminectomy belonging to Dr. James Kerr, under my observation, and which I reported in the June *Annals of Surgery*, an application of this solution was the means of healing a suppurating tract that had long resisted all treatment.

As to *phlegmons* of the hand or finger, the proper treatment is early incision, curettement, and a wet antiseptic dressing, preferably of warm mercuric-chlorid gauze constantly renewed several times a day.

No. 1701 H STREET, N. W.

THE FILTRATION OF WATER.

BY CHARLES V. CHAPIN, M.D.,
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As the water-sheds from which the supplies for our cities are drawn become more and more thickly populated, the danger of pollution of the waters obtained from them will progressively increase. The building of sewers is going on at a rapid rate in all our cities and larger towns, and even in many small villages, and unfortunately it is the too-common practice to discharge them into the nearest water-course, whether it be used for drinking-purposes or not. The water-carriage of sewage into a stream serving as a public water-supply is the most efficient mechanism that could be devised for the dissemination of such diseases as cholera and typhoid fever. Even when sewers do not discharge into a river, a few privies on the bank, or a few overflowing cess-pools, have been known to be sufficient to cause a widespread epidemic. And though all patent sources of pollution may be removed if the banks of a river or a lake have a considerable population, an accidental pollution may be followed by disastrous consequences. Thus in Providence, in 1888, an epidemic of typhoid was caused by the careless throwing of slops, containing excreta of a patient, upon the banks of the river from which the water-supply of the city was taken. Though much more than at present might be done to restrain this pollution by legal means, yet it is certain that at the best the danger of polluted waters will increase rather than diminish. The remedy that has hitherto usually been offered by sanitary engineers is to seek a new and a purer source of supply; but this is manifestly impossible in many cases, and in others, while perhaps feasible from an engineering standpoint, the great cost of the improvement would preclude its adoption. There is little doubt that many of our cities make use of water from a source that is more or less contaminated, and that there is little likelihood that these sources will be abandoned. The more practical question is: Is there any good method or methods within our means by which these waters can be improved?

The self-purification of rivers, which was formerly much discussed, we now know is a figment of the imagination, so far as the removal of disease-producing organisms is concerned. For the artificial purification of water a number of schemes have been suggested, and some of them put into quite general

practice. Before considering these it should be noted that the improvement desired is the removal of taste, color, odor, dead suspended matter, and micro-organisms. The latter is by far the most essential thing, but they are all important. The methods devised for the removal of these objectionable qualities are aëration, sedimentation, and filtration.

The thorough aëration of water, especially when the air is introduced under considerable pressure, is very effectual in removing unpleasant odors and tastes due to gases dissolved in the water. This method of procedure has been strongly advocated by Professor Leeds, of the Stevens Institute, and has been successfully employed in many places in this country. Aëration has been shown to have very little effect in oxidizing the dissolved organic matter, and none at all upon microörganisms.

Sedimentation is of very great value in removing not only the suspended mineral matter, but in getting rid of bacteria as well. For the purpose of freeing water from silt, clay, etc., subsiding reservoirs are in common use, and are often very successful. For the separation of living microörganisms such reservoirs would have to be very extensive, and I do not know that any have ever been built expressly for that purpose.

Filtration is the means that has most commonly been recommended to free water from disease-producing bacteria. As this method removes not only living organisms, but also all suspended matter, more or less of the color, and as it oxidizes a considerable part of the disorganized organic matter, it is the most efficient means of purification with which we are acquainted. There is no doubt that filtration can be relied upon to remove from 95 to 99 per cent. of the bacteria contained in the water applied to the filter, and that this will practically free the water from disease-producing qualities. It has been argued by some, even among the medical profession, that because bacteria are living structures capable of indefinite reproduction, the passage of any through the filter would render the filtration useless; and this would be so if water were like milk or bouillon, a favorable culture-medium for pathogenic microbes. But water is far from that, because instead of furnishing a suitable pabulum, our ordinary surface-waters are inimical to the life of the bacilli of typhoid and cholera. The Massachusetts State Board of Health has shown that typhoid bacilli die in the water of the Merrimac River in about three weeks, and most of them in far shorter time, and under the conditions that prevail in distributing mains all forms of bacteria tend to perish quite rapidly.

When by filtration both suspended matter and dissolved organic matter are largely removed, the water is still more unfavorable for pathogenic organisms, and the few that pass the filter do not live to reach the consumer. These theoretic considerations, as they might be thought by some, are entirely confirmed by the results of practical experience in the filtration of water known to be polluted, and its subsequent supply to a large number of people. The now well-known history of cholera in Hamburg and Altona is, perhaps, the most striking illustration of the value of good filtration. There is not the slightest reason to doubt that Altona would have been devastated far worse than Hamburg if it had not been for her filters. For many years Altona, with its filtered Elbe water, has suffered from typhoid fever far less than Hamburg, for which the water was taken directly from the river. In Berlin, too, the water supplied to the city from the Spree is constantly contaminated with typhoid excreta; but, except when overworked, as they are at times, the filter-beds have kept the death-rate from typhoid fever much lower than it is in Paris, Chicago, and Philadelphia. Typhoid fever has long been a phenomenally infrequent disease in London, and this is believed to be due to the filtration practised by all the water-companies that draw from the Thames and Lea rivers, which are always contaminated by sewage. It has, however, recently been determined that the purification of the London waters is due largely to sedimentation in the storage-reservoirs that are possessed by the different companies. Filtration is not managed as carefully as it should be in London, but the combined processes of sedimentation and filtration are successful in removing from 96 to 98 per cent. of the bacteria present in the river water. The diminution of typhoid fever in Lawrence, Massachusetts, since the filter was put in operation, somewhat more than a year ago, is cited as perhaps the only instance of the practical application in this country of sand-filtration to the removal of disease-germs from a public water-supply. There seems to be no question in the minds of those who have investigated the subject that sand-filtration is capable, when properly managed, of rendering perfectly safe a water that is even very seriously contaminated by specific organisms. But the construction and maintenance of a sand-filter is not so simple a matter as was at one time supposed. The careful investigations of Piefke at Berlin, of Kummel at Altona, and of the State Board of Health of Massachusetts, have determined some of the conditions necessary to success. Thus the rate of filtration should never exceed 2,860,000 gallons per acre per day. The rate in Berlin is 1,716,000 gallons, in Altona 1,859,000 gallons, and in seventeen German cities the average is 2,000,000 gallons. The area of the beds is of course determined by the rate of filtration, but there must be a reserve to allow for the beds thrown out of use for cleaning, repairs, etc.

The reserve recommended by most European engineers is equal to one-third of the area in use. In London the total area of the beds is 0.67 acres for each million gallons filtered daily.

The depth of sand in most Continental filters is about two feet, and this has been found to be as effectual as a greater depth, but owing to the somewhat different contents of our American rivers it has been found in Lawrence that the deeper the sand, up to four or five feet, the better. The pressure of water upon the filter should not be excessive, but the depth of water should be enough to prevent heating in summer and to float the ice off the sand in winter. About four feet constitute a good depth. The flow of water should be regulated automatically, and the filters should also be under skilled observation continually. Daily bacteriologic examinations should be made of the applied and affluent water. The greatest care must be taken in cleaning, which must be done every three or four weeks. The surface of the sand must be disturbed as little as possible, and it must never be allowed to freeze. The efficiency of a sand-filter depends upon a layer of silt and organic slime on the surface of the sand. In order that this layer may be maintained in a state of efficiency very great care and attention to details are required.

Of late years there have been largely employed so-called "mechanical" filters, which make use of a layer of ferric hydroxid or alumina upon the surface of the sand, instead of the "dirt layer," as the Germans call the surface of an ordinary sand-filter. In consideration of the difficulties in the management of sand-filters the City Council of Providence voted to construct a system of these mechanical filters—with this proviso, that it should be approved by the City Engineer, the Commissioner of Public Works, and the Superintendent of Health. After experimenting nearly a year the commission unanimously recommended the construction of such a filter-plant; but, owing to legal difficulties concerning patents alleged to cover the process, the works have not been built. The filter on which our experimental work was done was of the Morrison-Jewell type, and was thirty inches in diameter. It contained a bed of crushed quartz, three feet in depth. The filter was washed by running a reversed current of water through the quartz and at the same time agitating it by mechanical means. Various substances were used to produce the artificial filtering layer on the surface, but commercial aluminum sulphate was found to be the best. One-half grain of this to each gallon of water was sufficient to keep the filter working properly. The calcium carbonate in the water was found to be far more than enough to decompose this, precipitating the aluminum hydroxid upon the sand. Very delicate tests were applied several times each day to the effluent to determine if any of the unchanged sulphate passed through; but it could not be detected, even when the amount added was far greater than that found necessary. A minute portion of the hydroxid in suspension does pass through, but experiments in cities that employ this process show that it is all precipitated in the mains or intervening basins, and no test-reaction can be obtained from water at the taps in the distribution. It is certain that if used in the proper amount, and indeed far in excess of that, none of the aluminum in any form would reach the consumer. It has been thought by some that even the application of such a small amount of aluminum sulphate as one-half a grain per gallon must be harmful; but if the foregoing is correct, and it was substantiated by hundreds of tests, it cannot possibly exert any injurious action. Indeed, if the aluminum all went through the filter it would probably do no harm, for one-half grain of the commercial sulphate will yield only 0.12 grain of the hydroxid, and far more aluminum than that is contained in many, if not most, spring and well waters. I have made careful inquiry at Lakewood and Long Branch, Chattanooga, Atlanta, Newport, and a number of other cities which have used the "alum process," as it is sometimes called, and have failed to elicit any information which would show that the addition of "alum" to the water was unwholesome.

Our experiments showed that the filter was easily managed, and, for removing bacteria as well as for the other purposes of a filter, was more efficient than any other practical method with which we were acquainted. Our bacteriologic tests were made with great care, and for a large number of days hourly samples were taken. The average removal of water-bacteria as given by these tests was 98.7 per cent. Of course, the most satisfactory test of a filter is not the removal of water-bacteria, but the removal of pathogenic forms applied in known amount. We were so situated that it would have been imprudent to use typhoid bacilli, but instead we employed *B. prodigiosus*, which reacts in water much the same as the typhoid bacillus, and is largely used by the Massachusetts State Board of Health in their filter-experiments. The average removal of this organism was 99.8 per cent.

The removal of coloring matter amounted to about 80 per cent. The removal of the "free ammonia" was often complete, and of the "albuminoid ammonia"—dissolved organic matter—was 66 per cent. This is important, as it is much better than can be done with a sand-filter, and the removal of this material by precipitation removed just so much of the pabulum of the microörganisms.

It is very likely that for some cities sand-filters are

to be preferred, for when properly managed they do excellent work. But I believe that the best results are more likely to be obtained by the "mechanical" plan, and I therefore urged its adoption by my own city.

CLINICAL MEMORANDA.

A REVIEW OF SIX INTERESTING PATHOLOGIC CASES.

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CASE I. *Miliary tuberculosis; hemorrhage in the brain.*—Jesus V., forty-eight years of age, a Mexican, was admitted to the Arapahoe County Hospital, February 7, 1894, with a history of chronic illness and cough, with recent retraction of the head and delirium. He came under the care of Drs. McLauthlin and Eskridge, who after an extended examination diagnosticated meningeal tuberculosis. Deep coma came on, and on the 10th of February the patient died.

The post-mortem examination revealed the following condition: The patient's body was greatly emaciated. The membranes of the brain were exceedingly anemic. There was a milky-white exudate under the arachnoid, over both cerebral convexities, over the cerebellum on both upper and lower surfaces, along the anterior and middle cerebral arteries, in the anterior perforated space, and in the inter-peduncular space. Over the anterior surface of the pons, near the basilar artery and around the medulla, there were numerous tubercles imbedded in the inflammatory lymph and in the pia covering these structures.

In the left cerebral hemisphere, involving the medial surface and the upper portion of the convex surface of the hemisphere, there was a dark tumor-like mass lying in the quadrate lobe. Its anterior border was just in front of the upper portion of the fissure of Rolando, and the posterior border was at the parieto-occipital fissure. Laterally it extended from the median line outward one inch. Below it did not extend to the lateral ventricle. For a distance of from one-eighth to one-fourth of an inch surrounding the mass on its outer side was a layer of yellow softening. The tumor-mass resembled extravasated blood, with some appearances of a vascular infiltrating glioma. The remainder of the brain-substance was apparently normal. Sections of the hardened tumor-like mass were made, and it proved to be a simple extravasation of blood, due to a cerebral apoplexy.

The left pleura was free, except for some strong adhesions at the apex. The left lung presented a great many disseminated areas of tuberculous consolidation. These were of all sizes and of all shapes. The apex was solid for two inches down. The right pleura presented strong and old adhesions throughout. The upper half of the right upper lobe was completely solidified, and two small cavities were present at the extreme tip, each about three-quarters of an inch in diameter. Many small areas of consolidation existed in the middle and lower lobes of this lung. All presented tubercles. The heart was small, but its muscular tissue was normal in consistency, and the valves were normal. On the inner surface of the aorta there were a number of small calcareous plaques.

The abdominal cavity presented the point of greatest interest. Over the intestines and stomach, over the liver, over the diaphragm, over the spleen, pancreas, and bladder, indeed, following accurately every curve of the peritoneum, there was a grayish-white exudate from one-twentieth to one-sixteenth of an inch in thickness, and which could be peeled off without much difficulty, and in which were imbedded "millions" of miliary tubercles. The appearance as presented to the naked eye was as though a thin pliable layer of rough undressed kid or molded paper-pulp covered the peritoneum. Here and there the intestines were matted together by friable, easily broken down, fibrinous bands. In one square inch of the exudate I counted on its surface a hundred and eight tubercles. If we estimate the surface-area of the peritoneum at ten square feet the number of tubercles in this man's abdomen was 155,520.

In the dependent parts of the abdominal cavity there were three or four ounces of clear serous fluid. Section of the liver, spleen, and pancreas showed these glands to be normal, and no tubercles were found within. The left kidney was normal. The right kidney was likewise normal, except a few small cheesy areas in the cortex, none larger than a grain of wheat. The supra-renals were normal. The spinal cord was not removed.

From the wide distribution of the tubercles in this case it certainly falls under the head of miliary tuberculosis.

CASE II. *Acute croupous pneumonia; empyema; universal pericarditis; myocarditis and aortic aneurysm.*—J. J. G., an American, forty-seven years of age, was at the time of his death under the care of Dr. S. A. Fisk, who, six months before, had diagnosticated an effusion in the left pleura, with probably some tuberculosis of the left lung, and who had had a large amount of serous fluid aspirated at that time. The trouble continuing, empyema was suspected. A sudden onset of inflammatory symptoms occurred just before death, and an acute inflammation of the left lung was diagnosticated. A few days before his death the man spat up some blood, and an hour before he died he remarked that he felt inside his chest as if his blood was pouring out. In the left pleura was found a quart of sero-purulent fluid. Between the upper and lower lobes of the left lung much fresh inflammatory lymph was found. The entire left lung, from apex to base, was found in a state of red hepatization of acute croupous pneumonia. In the lung there were no tubercles and no cavity. The right lung was large, distended, emphysematous, and full of blood. Otherwise it was normal. The pleura was free. The pericardium presented universal adhesions. The cavity was completely obliterated. The adhesions were old, but they gave way to force. The heart-wall was friable and presented a deep reddish-purple color, with some mottling here and there by yellow patches. The endocardium presented large areas of racemose reddening. All of the heart-valves were normal.

From the aorta, just as it was given off from the left ventricle, there arose an aneurysm the size of a big fist, which projected to the left and anteriorly. This was filled with a mass of dark, grumous blood and partly

and completely organized clots. The aneurysm had no opening into adjacent structures. The blood which had been spit up came no doubt from the distended vessels of the right lung.

The spleen and pancreas were normal. Both kidneys were large and congested. The liver was deeply congested. The intestines and stomach were normal. The brain and spinal cord were not examined.

The case from a pathologic point of view was certainly a very interesting one. I felt sure that if we had been allowed to examine the brain we would have found a thrombosis. The sudden and rather unexpected death might have been due to true heart-failure, but from the condition of the clot in the aneurysm it is very probable that an embolus was the factor which immediately caused death. What occurred when the man felt his blood pouring out in his chest can only be surmised. As the clot in the aneurysm was very loose when it was examined, it is possible that its separation was occurring when he uttered his cry.

CASE III. *Subacute interstitial nephritis plus an acute parenchymatous and interstitial inflammation, probably "ether-nephritis."*—Charlotte C., thirty-five years of age, unmarried, was admitted to the Arapahoe County Hospital, March 27, 1894, under the care of Drs. McLauthlin and Collins. The history obtained was as follows: Five years ago she began running down, having malaise, frontal headache, leukorrhea, and many uterine reflexes. This condition continued up to her admission into the hospital. Up to six months ago menstruation was regular, but since that time she has menstruated much oftener than she should. On admission, her temperature under the tongue was 96° F., but on the following day it was normal, and it continued so for five days. The urine was carefully examined. Its specific gravity was low, and the amount passed was large, but it contained no albumin. A microscopic examination was not made.

On the sixth day after admission the woman had a temperature of 100°. After consultation and repeated examinations the trouble was diagnosticated as a pus-tube, and celiotomy was advised. The patient had been under Dr. Collins' care before for a partly adherent retroverted uterus.

On April 5th Dr. Collins performed celiotomy, and removed both tubes and ovaries. The left tube contained pus, and the right ovary was badly cystic. After the operation the temperature rose to 102°, then to 104°, and on the day of death to 106.8°. No symptoms of peritonitis were present at any time. The woman went into a state of coma, and died while in that state six days after the operation.

What had caused the patient's death was the question given me to solve. The post-mortem examination showed the following conditions: The abdomen was distended; there was an incision in the median line, below the umbilicus, for a distance of five inches. This cut showed nothing purulent. It had begun to heal throughout. The peritoneum below the cut was a little dark in color, but there was nowhere any evidence of peritonitis. The intestines were distended and projected from the abdominal cavity for about six inches. In the dependent portions of the abdominal cavity there were a few ounces of blood-stained serum. The peritoneum over the uterus, and all through the pelvic basin, was very dark in appearance, a grayish-black, and it was apparently disintegrating. It brushed off readily under the finger. There was an area the size of a watch on the ileum at the ileo-cecal valve, which was very dark and apparently necrotic, but this was all in the peritoneum, for section showed nothing else to be involved. The uterus was normal and movable. The stumps of the tubes were in good condition. Not a drop of pus, not a thread of fibrin, not an adhesion was found anywhere. The intestines were normal, although distended, and nowhere showed any peritonitis. The stomach was normal except in one or two places where the superficial epithelium was cast off, and where it looked as though there might have been ulcers at one time. The spleen was only one-fourth the normal size. The liver, pancreas, and suprarenals were normal. The left lung and pleura were normal. The right lung showed some catarrhal pneumonia, and much hypostatic congestion in the lower lobe. The pneumonia was principally located at the edges at the base and posteriorly. The pleura of this lung was normal. The pericardium was normal. The heart was small, and showed some fatty deposit over its anterior surface. The endocardium was normal except for slight evidence of inflammation of the mitral valves.

The right kidney showed the medullary portion quite deep in color. Its cortex measured about one-fourth of an inch, and was quite tough on section. The capsule was thickened, and on removal a portion of the cortex was torn away with it. The Malpighian bodies were not distinctly made out, and the tissue of the cortex could be seen to be more firm, dense, and translucent than normal. Section of this kidney showed that in addition to the interstitial process, with some chronic changes in the tubules and tufts, there was an acute inflammation present not only in the epithelial lining of the tubules, as seen by extensive desquamation and casts, but around and about the tubules, where a large array of leukocytes was found in the thickened connective tissue. The left kidney presented but few naked-eye appearances of any trouble, and on section showed nothing marked but cloudy swelling.

The brain and cord were not examined.

Here was a patient who, with an interstitial inflammation of one kidney, was given ether to narcosis for an extensive operation. Her death follows in six days, and an acute inflammation is found in the diseased organ, with no other organ showing extensive trouble.

CASE IV. *Appendicitis; cured tuberculosis.*—John R., a German, twenty-eight years of age, was treated at Davos, Switzerland, by Dr. Carl Ruedi for pulmonary tuberculosis with a great many hemorrhages. Dr. Ruedi said that the blood came from the left lung, and that at the time, five years ago, he could detect no cavity. The man came to Colorado three years ago, and resided at Salida. While under the care of Dr. Maxwell he developed appendicitis, and had had four attacks previous to this one. He refused operation. Five days before his death he developed the attack which was the cause of his death. Dr. Parkhill operated on him, June 7, 1894, and found the appendix perforated and the abdominal cavity partly filled with pus and lymph. The appendix was removed and the abdominal cavity washed out. The man developed septicemia, and died June 9, 1894.

All of the intestines were distended, and lymph and

sero-pus were in all the folds of the intestines, even up to the spleen. The omentum was bound down to the pelvic brim on both sides. The stump of the appendix was low down and lay very posteriorly. It was about three-fourths of an inch in length and was in a very softened, semi-gangrenous condition. Old adhesions existed about the colon, evidences of previous inflammations. The spleen was small and cirrhotic; the other abdominal organs were normal, as were the kidneys. The heart was normal. The left lung presented old adhesions at the apex and at the tip of the lower lobe, at which point there was a well-marked, clearly-outlined tuberculous cavity an inch and a quarter in diameter, beautifully isolated and separated from the rest of the lung by a dense fibrous capsule fully a twelfth of an inch thick. It was almost empty, but contained a small amount of cheesy tuberculous material. It was traversed by two or three tiny fibrous bands, and had two or three bronchi opening into it on its inner surface. It showed a few tubercles. The rest of the lung was normal. There was not a single infiltrated area anywhere, and not a tubercle could be found. The right lung was normal throughout. The right pleura presented a few adhesions at the apex and at the base posteriorly. The brain and cord were not examined. Certainly we had here a case in which Nature, aided by our generous climate, had isolated, and had in her own way practically cured a genuine tuberculosis. The bronchi opening into the cavity were large and were so situated as to drain.

CASE V. *Chronic hemorrhagic nephritis; nephrophthisis.*—Robert C., a laborer, forty years of age, born in Denmark, was admitted to the County Hospital, June 13, 1894, in a delirous condition. No history was obtainable, but Dr. Henry Sewall found many bubbling râles in the chest, indicative of pulmonary edema. The pulse ranged from 120 to 128, the temperature from 99 5° to 102°, and the respirations from 36 to 64. A careful examination of the urine showed a small per cent. of albumin. The patient continued delirious and had to be tied down in bed. Treatment directed toward the kidneys failed to produce any results; the patient became comatose, and died June 15th.

Dr. Mack, the hospital resident, stated that the patient had been in the hospital a year before for a supposed tuberculous testicle, which was removed.

The post-mortem was made seven hours after death. The left pleura had a few slender, old adhesions at the apex of the lung. The right pleura was adherent everywhere, but the bands could be broken down with the hands, except at the apex, where they had to be cut. The left lung was greatly edematous, and on section a part in the lower lobe looked as though it was in a state of catarrhal pneumonia, but the part floated on water and presented no elevated and depressed patches, and was, no doubt, simply edematous. The right lung was in the same state as the left, except that at the apex the pleura was thickened for a quarter of an inch. The bronchi in both lungs were filled with edematous fluid, which was blood-stained and frothy. The pericardium was normal. The heart was more than one-half again the usual size. The wall of the left ventricle was greatly hypertrophied, being fully five-sixths of an inch thick. The aortic valves and the aorta were normal. A large white clot was present in the left ventricle and in the aorta. The left heart was found strongly contracted. The mitral and pulmonary valves were normal. The right ventricle was dilated and its walls were thinned for such a large heart. A large, firm, white clot was present in this ventricle. The spleen was normal.

The left kidney was "a revelation." The organ was four inches long, two inches wide, and was buried in a mass of fat. The surface was found raised in rounded elevations the size of a large marble. The color externally was dark and bluish. On section the knife was covered with a white grumous paste, and the same material bulged from the kidney. The capsule of this organ was thickened to one-twelfth of an inch, and could not be removed. Running from the capsule into the kidney were a few thick fibrous bands like the capsule. Every vestige of a renal cortex and medulla had disappeared, being broken down into the whitish-gray, grumous material mentioned. This material was soft, like soft cheese. It could be spread, and would not dissolve in potash or chloroform. It lay in well-formed, fibrous capsules from which it could be easily removed, leaving cosy nests. The fibrous walls about were rather smooth, and, unlike what I expected to find, were not markedly ulcerated. A large mass of the cheesy material occupied the pelvis of the kidney and the beginning of the ureter. The mucous membrane of the pelvis seemed to be normal, though anemic. About the pelvis was a

large quantity of fat. In the fibrous capsules, about the grumous material, I detected a few tubercles, but none was present in the capsule of the kidney or in the pelvis. There was no suppuration. Dr. Le Garde examined the cheesy matter for the bacillus of tubercle, but found none. He pronounced the material to be granular débris and fat. He also examined the septa for the bacillus of tubercle, but he found none. From the distinctive naked-eye appearances of the kidney, however, I pronounced it tuberculous. The cheesy mass found was no doubt due to a tuberculous process, probably sec-

ondary to the tuberculous testicle, or possibly had been itself primary. The ureter and bladder were normal, although this examination, I regret to say, was hastily and carelessly made.

The accompanying illustration shows the destruction of the kidney-tissue.

The right kidney was four and a half inches long by two and a half inches wide. The cortex and medulla were separate and fairly distinct. Both the cortex under the capsule and the cortex on section, as well as the medulla, were mottled with white. The section presented light red areas alternating with lighter gray or yellowish-gray areas. The cortex was a little thickened, and a few small hemorrhages were present. The capsule stripped nicely. The pelvis was normal. To the naked eye this kidney presented all of the appearances of chronic hemorrhagic nephritis. The gray or yellow parts corresponded to the anemic or fatty-degenerated portions. Dr. Le Garde reported that the sections revealed parenchymatous and fatty degeneration of the epithelium lining the tubules, with granular infiltration of the interstitial tissue; thickening of the capsule of some of the glomeruli, and complete destruction in places of the uriniferous tubules.

Both supra-renals were cystic. The glands were apparently normal in size, but the parenchyma was lacking, and only a small bit of a semi-fluid brownish material occupied its center. A long observation of the supra-renal glands convinces me that they are often cystic, and that they break down quickly after death, if indeed not before.

The liver, pancreas, stomach, and intestines were normal. The brain and cord were not removed.

The specially interesting pathologic feature in this case was in the left kidney. It was the form of kidney called by the old authorities "scrofulous disease of the kidney," "strumous pyelitis," "scrofulous pyelo-nephritis," and the "inflammatory form of tuberculous disease of the kidney." In reference to the formation of the cheesy material found in it, Morris (in the *International Enclycopedia of Surgery*, vol. v, page 676) says: "Whether these cheesy masses are due to retrograde changes in confluent groups of miliary tubercles, or are the results of degeneration of the products of ordinary inflammation, pathologists are not agreed; some, indeed think that both conditions may exist at once, but that under such circumstances the tubercular process takes precedence of and excites the inflammatory changes." Such being the truth the absence of the tubercle-bacillus need not invalidate our diagnosis.

CASE VI. *Chronic parenchymatous nephritis, the inflammatory fatty kidney.*—Thomas W., a laborer, sixty years of age, born in Ireland, was admitted to the County Hospital, June 9, 1894, under the care of Dr. W. J. Rothwell. He had had malaria and dysentery. He was in perfect health in June, 1893, when, while walking on an elevated railroad track in New Mexico, he fell and injured his left leg. He was severely tumbled, and suffered from profound shock. He was taken to a Union Pacific Railroad Hospital, and was there for three months, being delirious much of the time. After he left the hospital he did a little work, but was not strong or well. He progressively ran down in health and became anemic and felt poorly. He came to Denver, and was sent out to the Arapahoe County Poor Farm. Here he began to have occipital headaches and diarrhea.

When the patient was admitted to the hospital he was intensely anemic, and his blood showed a deficiency of hemoglobin. The examination of the urine by the house-interne revealed nothing abnormal. This examination I believe to have been carelessly made.

The diagnosis was thought to lie between carcinoma and pernicious anemia.

On June 18th the patient vomited something that might be called "coffee-ground vomit." Mental apathy then came on, and he died in stupor June 20th. The night before he died the temperature in the axilla was 95°.

The post-mortem examination was made forty hours after death. The right pleura was free of adhesions. The lung floated in a pint and a half of blood-stained serum. The pericardium was normal and contained an ounce of clear serum. The heart was enlarged a third. It was very flabby and had much subserous fat on its anterior surface. All of the heart-valves were normal. Both of the heart-ventricles were dilated. The walls of the heart were friable and thin. The lungs were normal, but exceedingly edematous. Many old adhesions were found over the spleen. This organ was enlarged a half. It was very soft and friable. The left kidney was movable, forward, up to the median line. It lay imbedded in a mass of fat, and was enlarged about a third. It was pale and light in color and the capsule stripped, leaving the outer surface smooth and of a gray-yellowish red color, the yellow being pronounced here and there. The cortex was half an inch thick and showed a yellow faint mottled appearance. The pyramids were more prominent than usual, the red vessels and the yellow tubes being strongly contra-distinguished. No hemorrhage of any size could be detected. The pelvis was normal. The yellow of the cortex was very prominent in places. It was arranged in wedge-shaped masses, with the base at the cortex and the apex at the pelvis. It was a beautiful specimen of the inflammatory fatty kidney. I follow Strümpell's classification of chronic nephritis:

1. Chronic hemorrhagic nephritis, the large variegated or mottled kidney.
2. Inflammatory fatty kidney, the large white kidney.
3. The secondarily contracted kidney.

The right kidney was not movable. It was much more nearly normal than the left one, but its upper half was in the same condition as the left. The liver was large and apparently in a condition of cloudy swelling. All of the other abdominal organs were normal. The supra-renals were cystic. The brain and cord were not removed.

This case showed the value of a post-mortem examination. It had been registered "pernicious anemia" at one time.

POST-MORTEM DEMONSTRATION OF A CASE OF PYEMIA, FOLLOWING A LATENT OTITIS MEDIA.

BY S. B. CLARK, M.D.,
OF CHICAGO.

THE case reported occurred in a post-mortem examination at the Cook County Morgue, under Dr. Ludwig Hektoen, October 18, 1893. The patient was a man,

aged twenty-one, a porter by occupation; of negative family history. He was admitted into the hospital October 21, having been sick about three weeks; he complained of chills, fever, nose-bleed, loss of appetite, and general debility; no cause was given for the sickness, and the man had previously been well. When admitted he was stupid, the skin yellowish, the tongue thick and coated; examination of the lungs and heart was negative; the spleen was not enlarged. The temperature was about normal and the pulse slightly accelerated. On the second day after admittance he had a marked chill, and the temperature rose from 97.5° to 102°. Chills and fever continued in such irregular manner that malaria was suspected, but blood-examination was negative. The pulse was generally over 100, and when the chills came on would rise as high as 140 or more.

On October 8th tenderness and pain developed in the right lung over the region of the mammary gland; there was dulness on percussion, and the respiratory and vocal sounds were somewhat diminished. On October 18th, the apex-beat of the heart was displaced to the left of the nipple-line one inch, in the fifth interspace, and cardiac dulness was increased. The pulse became rapid and jerky, and the patient died in an exhausted condition.

The post-mortem examination revealed the following changes: The body was much emaciated; examination of the abdominal contents was negative, except that there was swelling of the mesenteric glands. The pericardium, with the heart, was compressed and pushed toward the left side by turbid semi-solid fluid in the right pleura, held in by adhesions. The pericardium was also adherent to the left lobe, and in front the pleura was adherent to the sternum by grayish purulent masses. An opening was seen through the left pleura back of the sternum, that communicated with the lung.

In the left pleural cavity were weak adhesions, and a small quantity of turbid, yellowish fluid, in which were solid fibrinous masses. The heart-examination itself was negative.

The right lung showed numerous septic infarcts anteriorly where the pain had been felt. The lobes were adherent, and many yellowish softened areas, with their bases toward the pleura, were easily discernible, of a foul odor, and some of them fused together, containing purulent material. This lung did not float, and when incised showed many yellowish necrotic foci.

The original cause of these many metastatic foci could not yet be accounted for, and we made preparations to examine the brain.

In the meantime the right internal jugular vein, from its commencement at the jugular foramen to the right innominate vein, was found to be in a condition of suppurative thrombo-phlebitis, and contained a semi-solid mass of foul, viscid, purulent material from beginning to end.

After the calvarium was removed and the brain taken out, a septic focus was found in the middle ear, and another in the mastoid cells, and leading from this the veins connecting with the lateral sinus were found in a condition similar to the internal jugular.

The lateral and other sinuses of the dura mater were in a suppurative, thrombo-phlebitic condition also.

This readily explained the route of infection, down the lateral sinus to the internal jugular vein, thence through the innominate vein, the superior vena cava, and heart to the lungs.

The autopsy well illustrated how a trifling little abscess of the middle ear, so small as not to be noticed by the patient, may cause the gravest form of pyemia and death.

MEDICAL PROGRESS.

Bilateral Orchectomy for Chronic Hypertrophy of the Prostate.—At a recent meeting of the Allegheny County Medical Society, at Pittsburg, DR. J. D. THOMAS reported the case of a man, sixty years old, who for ten years had had progressively increasing frequency of micturition, so that in urinatiing he was compelled to get upon his hands and knees, thus emptying his bladder by drops. The straining resulted in prolapse of the rectum. A catheter had been used, but the pain was so intense that the practice was abandoned. The urine was neutral in reaction, and contained a large amount of pus. There were two ounces of residual urine. A soft catheter could be introduced without much difficulty, and on rectal examination both lobes of the prostate were found to be considerably and uniformly enlarged. Bilateral orchectomy was proposed, accepted, and performed. Improvement in urination was perceptible within a few days, and continued subsequently without medicinal treatment. The urine could be retained for from two to six hours by day and for two hours at night. Micturition was attended with little pain. On rectal examination the size of the prostate gland was found to have appreciably diminished.

A Mindless Frog.—At a recent meeting of the Association of American Anatomists in New York, PROF. BURT G. WILDER showed a frog from which, under ether, the entire cerebrum had been removed three weeks before. The animal looked natural. The scar on the head was hardly visible. The frog could swim and jump and even balance on a cylinder slowly turned, and could swallow food placed far back in the throat. When undisturbed it sat without motion, and presumably had no consciousness. That such a frog, while in possession of all its senses (excepting smell, the olfactory lobes being removed with the cerebrum), had no intelligence was shown by the behavior of a similar specimen shown the American Neurological Association in 1886. A minnow was put into the mouth. The head reached the throat and aroused the swallowing reflex; but the tail protruded from the lips and caused the frog to put up its hands to push it out. The normal frog would have decided whether the fish should go up or down. The decerebrized animal was a mere reflex machine, and could make no choice between incompatible operations.

A Case of Muscular Dystrophy.—At a recent meeting of the New York Neurological Society, SACHS presented a young woman with all the characteristic symptoms of muscular dystrophy of the facio-scapulo-humeral type. On attempting to show the teeth she was able to move the lower lip slightly, the upper one not at all. There was also loss of power in the eyelids, and the symptoms in the region of the shoulder-girdle were very

characteristic. There was distinct hypertrophy of the infra-spinatus and supra-spinatus, and atrophy or partial atrophy of the serratus, the pectorals and the rhomboids. The patient was unable to raise her arm beyond a horizontal position. In excising quite a large piece of the infra-spinatus muscle, a considerable part of the nerve, as it enters the muscle, was accidentally removed. Histologic examination disclosed a great preponderance of fatty tissue, with hypertrophy of some and atrophy of most of the muscular fibers, and distinct evidence of degeneration of the nerve. Decided improvement in the condition of the patient took place. The muscles of the lower extremities were slightly atrophied.

The Protective Influence of the Blood-serum of Convalescents from Diphtheria and of Healthy Individuals.—As the result of an experimental investigation, ABEL (*Deutsche medicin. Wochenschr.*, 1894, Nos. 49, 51) arrives at the conclusion that the blood-serum of many healthy individuals, between the ages of twenty and forty years, who have never had diphtheria, possesses the property of protecting guinea-pigs against infection with diphtheria. It was found that the blood-serum of convalescents from diphtheria did not possess a similar property for the first few days after the cessation of the disease (disappearance of the membrane), but that this property manifested itself in the majority of cases after the lapse of from eight to eleven days, disappearing again at the end of several months, but not in all cases.

The Presystolic Murmur.—At a recent meeting of the Société de Biologie BERNHEIM (*La Médecine Moderne*, 1894, No. 89, p. 1386) contended that the so-called presystolic murmur is in reality systolic, as sphymographic tracings show that a tenth of a second elapses between the systole and the occurrence of the murmur. The murmur also follows the impulse of the heart.

To Stain Nervous Tissue AZOULAY (*Bulletin de la Société Anatomique de Paris*, October, 1894, p. 676) immerses for fifteen minutes sections impregnated with osmic acid in a 10 per cent. solution of tannic acid. The myelin is thus colored black, and the sections may be subsequently stained with carmin.

Sporozoa in Sarcoma.—VEDELER (*Centralblatt für Bakteriologie und Parasitenkunde*, Band xvi, No. 21, p. 849) describes a sporozoon which he found in sections of sarcomata, and which he believes to be the specific cause of these neoplasms.

THERAPEUTIC NOTES.

The Treatment of Diphtheria with the Antitoxin.—Of twenty-four cases of diphtheria treated with the antitoxin by KUNTZEN (*Deutsche medicin. Wochenschr.*, 1894, No. 49, p. 918), recovery ensued in 21 and death in 3. Two cases that came under observation on the first day, 6 that came under observation on the second day, 2 that came under observation on the fourth day, 2 that came under observation on the fifth day, and 1 that came under observation on the eighth day of the disease, recovered. Of 7 cases that came under observation on the third day, 6 recovered and 1 died; 1 that came under observation on the sixth day died; and of 3 that came under observation on the seventh day, 2 recovered and 1 died. Tracheotomy was necessary in 5 cases, 2 of which were fatal. The diagnosis was in all cases based solely on clinical data.

SONNENBURG (*Deutsche medicin. Wochenschr.*, 1894, No. 50, p. 930) reports that from June, 1893, to October, 1894, Behring's antitoxin was employed at the Moabit Hospital in Berlin in the treatment of diphtheria, with two intermissions when the serum was not attainable. These intervals occurred from July 1, 1893, to December 1, 1893, and from April 1 to July 31, 1894. The injections were given immediately after admission, from 600 to 1800 immunity-units being administered, according to the severity of the case. During the period of serum-injections 107 cases were treated, with 85 recoveries (79.4 per cent.); tracheotomy was required in 34, of which 26 recovered (76.5 per cent.); 12 cases were not injected from economic reasons; of these, 6 were mild, and recovered; 6 appeared hopeless, and died soon after admission. Of the 95 cases treated with injections 79 recovered (83 per cent.). In the intervals during which no serum was available, 116 cases were treated; of these 84 recovered (72.4 per cent.); 47 required tracheotomy, with 29 recoveries (62 per cent.). Most of the fatal cases treated with the serum came under observation on the third day, or later. Since October, 1894, prophylactic injections of 60 immunity-units have been made among the brothers and sisters of cases of diphtheria. Of 16 cases thus treated dipththeria developed in two, both of which responded readily to injections of 600 immunity-units, and pursued a mild and favorable course. In one of these cases the disease was probably already present at the time of the prophylactic injection. In the other the attack occurred thirty-seven days after the injection.

At a recent meeting of the Berlin Medical Society, HANSEMANN (*Berliner klinische Wochenschrift*, 1894, No. 50, p. 1126) formulated the conclusion that there is no scientific reason, theoretic or experimental, for considering the antitoxin of diphtheria a specific remedy in the treatment of diphtheria in man. It was contended that the demonstration of any specific curative property of the serum in man had not yet been practically made, and it was pointed out that the agent may, under certain circumstances, act injuriously, exercising a destructive influence upon the blood and causing irritation of the kidneys.

In the discussion, VIRCHOW (*Münchener medicin. Wochenschr.*, 1894. No. 50, p. 1023) related that of 533 cases of diphtheria at the Kaiser and Kaiserin Freidrich Kinderkrankenhaus, 303 were treated with the antitoxin, with a mortality of 13.2 per cent., while among 230 treated with other measures the mortality was 47.8 per cent.

At a recent meeting of the Société Médical des Hôpitaux, MOISARD (*Le Mercredi Médical*, 1894, No. 50, p. 613) reported the employment of the antitoxin during the months of October and November, 1894, in 248 cases of diphtheria, with 34 deaths (14.71 per cent.). In 14 cases an urticarious eruption developed; in 9, a scarlatiniform erythema; in 9, erythema multiforme, and in 1 a purpuric condition.

LE GENDRE (*Médecine Moderne*, 1894, No. 100, p. 1678) related that he had employed the antitoxin in the treatment of 16 cases of diphtheria, with 2 deaths.

LEBRETON (*Ibidem*) reported that during October and November there had been treated at the Hôpital des Enfants 242 cases of diphtheria, with 28 deaths (11.66 per cent.). Deducting cases in which death followed within twenty-four hours of coming under observation, the mortality did not exceed 8 per cent.

SEIZ (*Therapeutische Monatshefte*, 1894, H. xii, p. 605) reports that from July 1, 1893, to the middle of October, 1894, there were admitted to the hospital at Constance 159 cases of diphtheria, mostly of severe grade, 66 of which terminated fatally (41.5 per cent.). Tracheotomy was necessary in 54 cases, intubation in 8. In addition, 134 cases occurred in the city, with 24 deaths (17.9 per cent.). Included in these statistics are 27 cases treated with antitoxin, with a single death. Of these, 20 received injections on the first day; 4, on the second; 1, each, on the first and second, and on the first and tenth days. The fatal case came under observation on the third day, with stenosis of the larynx, and died within a short time.

MENDEL (*Berliner klin. Wochenschr.*, 1894, No. 48, p. 1088) has reported the case of a boy, four-and-a-half years old, in which, on the second day of an attack of diphtheria of moderate intensity, one-thousand immunity-units of Behring's antitoxin were injected, and on the third day an additional six-hundred units. On the seventh day, contrary to instructions, the patient arose from bed, and shortly afterward a generalized hemorrhagic exanthem suddenly made its appearance. A particularly large area of hemorrhage occupied the site of injection. There were, besides, pains in the extremities. The condition slowly receded without relapse, and recovery ultimately ensued. The complication is ascribed to the action of the serum, which, it is known, has a destructive effect upon the red blood-corpuscles, and of which 20 c.c. were employed.

Salicylated-Iron Mixture.—

℞.—Sodii salicylatis	ʒiv.
Tinct. ferri chloridi	fʒiv.
Acidi citrici	grs. x.
Glycerini	fʒiss.
Ol. gaultheriæ	♏ viij.
Liq. ammon. citratis, q. s. ad. .	fʒiv.♏

Sol. sec. art. dos. fʒj or fʒij.

Dissolve the citric acid and sodium salicylate in the liquor ammonii citratis. To the glycerin add the tincture of iron chlorid, and then mix the two solutions, finally adding the oil of gaultheria. One or two drams of mucilage of acacia would be a valuable addition with which to emulsify the oil of gaultheria.

In this prescription reaction takes place between the ferric chlorid and sodium salicylate, resulting in double decomposition, giving iron salicylate in the first solution. Care should be taken to keep the liquor ammonii citratis in slight excess, in order to have a perfectly clear solution of salicylate of iron.

Dose.—One or two teaspoonsfuls.

This prescription is used principally in the treatment of chronic cases of rheumatism or rheumatoid arthritis in which anemia or other evidence of impaired nutrition is a distinct feature. It is likewise employed in acute tonsillitis of rheumatic origin, and in acute articular rheumatism in anemic subjects, especially if the patient has suffered from one or more previous attacks.

The ordinary dose in chronic cases in adults is a dessertspoonful four times a day; in acute cases the same dose is given every two hours until tinnitus is produced or decided amelioration has occurred, when the dose is diminished or the intervals between doses lengthened.—S. SOLIS-COHEN, *Phila. Polyclinic*, vol. iii, No. 32, p. 31.

Recovery from the Ingestion of One Ounce of Chloral Hydrate.—At a recent meeting of the Clinical Society of London, COLENSO (*Medical Press and Circular*, No. 2895, p. 454) reported the case of a very powerful woman, thirty-four years old, of large build and good condition, who deliberately took an ounce of chloral hydrate in solution, being discovered in bed unconscious eight hours later. When seen, an hour and a half after this, the patient was found to be comatose. The reflexes were abolished; the breathing was shallow and stertorous; the pupils small and sluggish; the pulse 130, small and firm; the temperature 100.5°. It was only three hours later that the nature of the poison taken was discovered. Atropin was given hypodermically, and the stomach washed out with much difficulty. Strychnin and ether were injected subcutaneously, and amyl nitrite given by inhalation. When the nature of the poison was learned, enemata of strong coffee were given, and sinapisms applied to the thighs and legs. The woman was also vigorously rubbed and slapped with towels. The treatment was thus continued for several hours, the patient finally being roused. Short intermissions of ten minutes at a time were allowed for sleep, then the patient was taken from bed and made to walk about. On the following day the patient slept thirteen and a half hours of the twenty-four. Recovery ultimately ensued.

The Treatment of Pyrexia.—WHITE (*British Medical Journal*, No. 1768, p. 1096) maintains that hyperpyrexia should be energetically treated with cold baths, while the routine use of antipyretics in ordinary pyrexia is to be condemned. In the cases in which benefit follows coincidently with the reduction of the temperature the means employed has a specific beneficial effect on the particular disease; consequently, the temperature falls at the same time as the other symptoms improve. The means used is only antipyretic in the same sense as mercury is antipyretic in syphilitic fever. Phenazone, acetanilid, and phenacetin should rarely be used as antipyretics.

The Treatment of Scleroderma.—The Vienna correspondent of the *Lancet* (1894, No. 3715, p. 1126) quotes BEER as having reported four cases of scleroderma treated successfully by massage continued for a long period. In one case the treatment was persisted in for a year; in another it was pursued for three hours daily for some months. To overcome the muscular atrophy the faradic current proved useful. One of the patients, who weighed only thirty-two pounds when the treatment commenced, and whose muscles were so atrophied that he could not move his extremities, which were held in a flexed position, recovered, and weighed one-hundred-and-five pounds after treatment for some months.

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"HIGHER MEDICAL EDUCATION."

MEDICAL men and all who have studied the problems of medical educution, its defects and its needs, will read with interest the little work of DR. WILLIAM PEPPER bearing the above title. Surely no man in this country speaks with more authority on this topic; none has done more in molding latter-day opinion and policy, or in inaugurating and practically aiding important reforms. The addresses which comprise DR. PEPPER'S book were delivered before the medical classes of the University of Pennsylvania on October 1, 1877, and October 2, 1893, the dates respectively of the establishment of the three-year and the four-year course in medicine in that institution; and, though they deal mainly with the problems presented to that school, they apply with equal force to the status of medical education in other centers at the same time, and represent most forcibly the former needs and the later accomplishments in the direction of an ideal system of medical education in America.

The first of these addresses is largely retrospective, reviewing with care the origin of medical teaching on this continent, the high plane on which this was conducted at the outset, and the subsequent falling off from these honorable standards.

The medical school of the University of Pennsylvania, having the distinction of being the oldest medical school on the American continent, was founded in 1765, largely by the efforts of JOHN MORGAN and WILLIAM SHIPPEN, JR., both recently returned from their studies in Edinburgh. The plan of organization was closely modeled after that of the larger European schools, and in particular after Edinburgh. Such candidates only were admitted who had received a collegiate degree or who satisfactorily passed an examination in Latin, mathematics, and natural and experimental philosophy. The course of study led first to the degree of bachelor of medicine when the student had served an apprenticeship to a reputable physician, had attained a knowledge of pharmacy, had attended one complete course of lectures, and had followed the practice of a general hospital for one year. A private followed by a public examination were further requisites. After three years the applicant was granted the degree of doctor when he had written and publicly defended some thesis on a medical subject. It will thus be seen that it was no idle boast of the Trustees that their medical school presented as "liberal and extensive a plan as most reputable European seminaries." In particular, hospital instruction was rendered possible by the inauguration of clinical teaching in the Pennsylvania Hospital in 1760, and in the Philadelphia Almshouse in 1770, and continued an obligatory part of the student's work until 1845.

Unfortunately for medical education, this high plane of excellence cannot be said to have been maintained in subsequent years. The rapid multiplication of schools of indifferent worth and the active competition of these led to a steady lowering of standards until in later years the character of medical education in America was truly deplorable. A comparison of European schools in 1877 with those of our own country illustrates this most forcibly. In the former it will be found the student was required to pursue a regularly graded course of instruction extending over a period of four, five, six, or even seven years; he received personal training in all practical and clinical branches, and he was required to pass an impartial examination by disinterested individuals. It is idle, as DR. PEPPER well observes, to state that the conditions in America did not permit of such advanced and prolonged study, and it was indeed the self-complaisant contemplation of their own excellencies that led men to feel that such a course

might produce learned philosophers, but not doctors in any way superior in the setting of a fracture or the contrivance of a potion than those of less rigid education.

What a contrast was presented by the American medical schools! In the first place, no preliminary examination at all was required at matriculation, and the course of study was but two terms of less than five months' duration, with a provision that the student "have attended the practice and been the private pupil of some respectable practitioner," a provision which was notoriously useless and practically inoperative. The course of study was entirely ungraded, so that the new student, without a rudiment of medical knowledge, at once entered upon advanced studies with those about to graduate. Voluntary lengthening of the time of study by the student was therefore scarcely advantageous. Instruction was wholly didactic, saving only the practical work of dissection. Finally, and this perhaps more than anything else led to the pernicious system of medical education, the examinations were conducted and degrees conferred by teachers whose remuneration depended altogether upon the size of the classes.

It was this last grave fault, depending largely on the absence of any supervision by the State and the absence of any system of State examinations, that led to the inordinate number of medical schools and the numerous fraudulent establishments which granted diplomas for small pecuniary considerations, and made the very name of "American Medical Diploma" a reproach in all the world. The number of regularly chartered medical schools was and remains to this day ridiculously large, while the number of "bogus" universities and the extent of their operations can scarcely be determined. Of the regular medical schools following the establishment of that of Pennsylvania in 1765, that of Harvard in 1782, and of Dartmouth in 1797, there were established in the succeeding decades respectively, four, six, three, ten, ten and eight, exclusive of various irregular schools. There were thus in operation at the close of the late Civil War forty-four regular medical schools. In the reactionary period following the war, from 1867 to 1877 inclusive, twenty-one medical schools were organized. At the period of DR. PEPPER'S first address there were therefore sixty-five regular schools, and in addition eleven homeopathic, four eclectic and fourteen schools of pharmacy. As druggists largely practised medicine, there were practically ninety-four schools graduating practitioners of medicine, or one to 477,392 inhabitants, whereas in the countries of Europe and generally throughout the world one medical school for about 2,000,000 inhabitants has been found the proper proportion. There were graduated in the year 1876 from the American schools about 3000, or from five to six times the number graduated in Germany, or in Austro-Hungary; four times as many as in France, and almost twice as many as in Great Britain. This inordinate over-production had of course led to an undue proportion of practising physicians to the total population; so that while in all other countries there was one physician to from 1800 to 7000 or even 10,000 inhabitants, in the United States there was one to 600 of population. These evils, with the auxiliary and dependent misfortunes, such as unnecessary multiplication of free dispensaries, the stimulation to quackery in consequence of the lowered standards, and the like, are clearly and eloquently set forth; and with rare foresight (looking at the question from the vantage ground of to-day's accomplished events) DR. PEPPER formulated the lines on which reform must proceed.

These reforms were: The establishment of a preparatory examination; the lengthening of the course to at least three full years; the careful grading of the course; practical instruction at the bedside and in laboratories; and the establishment of fixed salaries for the professors, so that they might no longer have any financial interest in the size of their classes. Clearly as these reforms seem to us to-day desirable and sufficient, only those who have had an interest or a part in the accomplishment of the improvements can adequately appreciate the difficulties which opposed their final adoption. "Here, as elsewhere in education," says DR. PEPPER, "those who desire progress must have a regard for actual conditions and practical possibilities." The University of Pennsylvania had indeed made an effort at reform in 1846 by the establishment of a three-years' course, but it was forced after six years of steady diminution in the size of her classes to abandon this most commendable effort. Subsequently, after years of agitation and at times more acrimonious contention, the lengthening of the course was effected at Harvard in 1871, and later at Michigan, Syracuse, Chicago Medical College, and for a second time at Pennsylvania. During the same years the spirit of progress had effected other changes—examinations at matriculation,

rational grading of the courses, and increased length of the academic year. In most of the better schools the old system of remuneration of the professors had been abolished, and practical instruction, so difficult, so costly, and yet so essential, had been made an important part of the curriculum.

All of these changes had been wrought not alone at the expense of much earnest advocacy on the part of men like DR. PEPPER, who saw clearly the need of medical education, but also at no little financial loss incurred by the smaller classes of the first few years. The change, however, was effected, and, with the example of Harvard and Pennsylvania and others, the great body of medical schools were slowly drawn to a similar advance, so that by the time of the second address, delivered on October 2, 1893, of the 118 schools from which information could be obtained, only twenty-three adhered to the two-years' standard and eight had instituted an obligatory four-years' course. In nearly all more or less satisfactory grading of the course of study had been effected. Preliminary examinations at matriculation had been instituted by many, though the rigidity of these might still be questioned. It may very well be urged that the requirement of an academic degree is beyond the present needs of advanced education; but the fault, if fault there be, lies, as DR. PEPPER shows, in the advanced age of our collegiate students. The average age at graduation is now from one to three years beyond that of students in foreign countries at their entrance upon their professional studies; and the age at which the student finally graduates and is prepared to enter practice is unquestionably too advanced. Changes should be effected by which the student may finish his collegiate studies at an earlier age; and an arrangement such as that adopted at the University of Pennsylvania, of admitting students from approved colleges who have devoted a large part of their time to biologic studies to advanced standing in the medical school is highly commendable.

The process of time and the labors and generosity of a few men, seconded by the indorsement of all thinking men of the profession have thus wrought a complete change in our system of medical education. It may be some time before the standard of the leading schools is adopted by others, but the tide has set in this direction, and the public will expect or demand a higher standard from all the schools. In this process some will surely perish, but the excessive proportion of schools to population indicates that this is desirable. Only those can and ought to survive which can offer the student all that practical, clinical, and laboratory instruction that is demanded by the modern systems of medical education. Institutions founded in places where meagerness of population or other causes make this impossible have no right to exist, and will not long continue to do so. All honor is due to the pioneers in this work who have pushed on in spite of temporary setbacks and harsh criticism, and at the greatest cost, this work of higher education. Well, indeed, and with the honest pride of personal contribution, might the learned author of this little work point to the progress and standards of educational advancement no less honorable and elevated than those of our material prosperity, presented to the nations at the time of the great Columbian Exposition in comparison with the conditions at the close of our last great exposition of 1876. During these memorable years no institution did more for the cause of higher medical education than the University of Pennsylvania, and no man more yeoman service than her distinguished guide and ruling spirit, DR. PEPPER.

EDITORIAL COMMENTS.

The Micro-Chemic Reactions of Urinary Sediments.—While the diagnostic significance of the staining reactions of various organic substances has received recognition in both biologic and histologic research, the application of this method of differentiation is capable of extension and elaboration. The schizomycetes, for instance, present such a close resemblance one to another that it is often quite impossible to recognize a given variety from its morphologic appearance. Some can be discriminated by their behavior when exposed to certain stains and decolorizing reagents, while the identity of others is only to be established by their appearance in cultures. Histologically we know that the body and the nucleus of a cell each reacts differently to stains; as do also healthy and diseased structures. Extending the application of the principle, we find that tube-casts in the urine when stained behave diversely in accordance with their chemic constitution, amyloid casts, for instance, assuming a mahogany tint when treated with iodin, and a deep blue when treated with gentian-violet. An interesting contribution to the subject of the color-reactions of urinary sediments has recently been made from the Pathologico-Chemic Institute of the Rudolph-Stiftung in Vienna by GROSZ (*Internationale klinische Rundschau*, 1894, No. 41, p. 1465), who has studied the formed elements contained in urine stained with alizarin. To a drop of urine placed on a slide he adds a drop of a 1 per cent. solution of sodium alizarin sulphonate, and then covers, the examination being made after the lapse of about a

minute. The sediment present is stained differently according to the reaction of its constituent elements. Thus, those of acid reaction appear yellow, those of alkaline reaction violet, and those of neutral or feebly acid reaction red. In the urine from cases of acute gonorrhea were found cylindroidal bodies of mucin, staining red, and resembling tube-casts, the likeness being increased by the presence of leukocytes and epithelial cells. Further investigation rendered it probable that these bodies (which are not visible in unstained preparations) are derived from the glandular apparatus of the urethra, and more particularly from the glands of Littré. Other long, convoluted, and hyaline cylindrical bodies, upon which are seated isolated leukocytes and epithelial cells, and which appear in unstained preparations as structures of faint contour, are derived from the prostate gland, of disease of which their presence is suggestive. They were also found in the urine passed after coitus. In contradistinction to these urethral and prostatic structures, renal tube-casts stain intensely yellow. The presence of casts is also associated with the absence of a mucoid ground-substance that stains red, and accompanies the other two. In some cases of disease of the posterior portion of the urethra leukocytes stained violet were observed, but the number of cases was not sufficiently large to establish the diagnostic significance of the observation. The opinion is expressed that the reaction of the epithelial cells progresses from acid to alkaline, from the surface to the deeper layers; so that the reaction of the sediment in the urine will indicate the nature and seat of the morbid process in the genito-urinary tract.

The Dangers of Foot-ball.—A danger of foot-ball hitherto unrecognized or disregarded is the occurrence of albuminuria, with the presence of casts in the urine, as a result of the great activity entailed by the violent exercise. A series of interesting observations upon this subject has recently been recorded by MACFARLANE (*Medical Record*, No. 1258, p. 770), who obtained a response to Heller's nitric-acid test for albumin with the urine voided by nine players immediately after a game. On standing for twelve hours there was a heavy sediment in each case and microscopic examination disclosed the presence of urates, crystals of uric acid, calcium oxalate and a large number of casts, some epithelial, a number granular and many hyaline. On examination of the urine of six of the players voided three-and-a-half hours after the game a response to Heller's test was obtained with one specimen, a response to Tanret's test in every instance, and a response to Millard's test in three. On microscopic examination a few casts, mostly hyaline, were found. On another occasion the urine of twenty foot-ball players voided immediately after the game was examined and albumin in considerable quantity found in every instance. In all casts were also found, some granular and hyaline, and in some blood-casts. There were present, besides, many epithelial cells, an abundance of oxalates, urates and crystals of uric acid, and in a few considerable blood.

The question naturally arises whether such conditions can be induced twice or oftener weekly for a considerable length of time without risk of permanent damage to the kidneys, and further whether there is not considerable danger for players already suffering with functional or organic disease of the kidneys.

Food-adulteration from an English Standpoint.—A Parliamentary Committee is seeking light on the extent and nature of food-adulteration and on the methods of preventing it. Several more or less distinguished experts have been examined at considerable length. The evidence is too bulky to be even outlined here, but among the interesting points brought out in the examination of MR. JAMES LONG, a well-known authority in dairy chemistry, was that several brands of condensed, closely skimmed milk (separator-milk) are largely sold in England, generally without due notice as to their insufficiency in fat. MR. LONG regards separator-milk as "unquestionably" nutritious, but naturally deprecates foisting it on the public as whole milk. Another point brought out was that a brand of condensed milk, labelled "Swiss Dairy," and ornamented with a scene in the Alps, is made in Ireland.

The sale of separator condensed milk seems to be much less frequent in this country; at least some analyses made lately for THE NEWS failed to discover any condensed milk notably deficient in fat.

The Transmission of Cholera by Flies.—It has been shown experimentally that flies may act as the carriers of cholera-infection. (See MEDICAL NEWS, March 25, 1893, p. 328.) The recent epidemic at Gaya gaol, in India, furnishes confirmatory evidence upon this important subject. It is related that the first case occurred in a newly-admitted prisoner, who appears to have contracted the disease on his way to the gaol. He occupied successively a number of wards, in each passing several evacuations that were not specially dealt with. The water used was beyond suspicion, and direct proof of the conveyance of cholera-organisms from the excreta to food was wanting. On the other hand, about the gaol were swarms of flies having easy access to both the intestinal evacuations and the food and milk; and bacteriologic examination of specimens of sterilized milk exposed in new vessels, to which flies were permitted access in various parts of the gaol, disclosed the presence of cholera-bacilli.

House-filters vs. Municipal Filters.—We alluded a short time ago to the exhaustive investigation into the efficiency of house-filters, the results of which are still in course of publication by the *British Medical Journal*. It is quite evident from the data furnished, as well as from those reported by other investigators, that wherever a general filtration-system is available it affords the safest means of securing pure water. However anxious the householder may be to obtain a good house-filter there is no certainty of getting one, nor is the maintenance of a filter in proper condition always an easy matter.

The municipality that does not furnish its citizens with an abundant supply of perfectly clear and wholesome water fails in one of the fundamental objects of human society. There will be no market for a house-filter in any city whose affairs are well administered.

For the Boy and His Father.—Every parent has felt the duty of instructing his son as regards sexual matters,

especially if he suspects bad habits, and he has also felt the solicitude lest attempted instruction should arouse curiosity when it did not yet exist, and thus do harm instead of good. To steer safely between the double danger has been often tried, and almost as often the attempt has failed. It is an exasperatingly difficult thing to do—in print. In a little monograph (*Temptations, Habits, Character*, Arena Publishing Co.), Dr. Wm. M. Capp, of Philadelphia, has by all odds succeeded better than any previous writer known to us in the task, and we cordially commend the pamphlet to perplexed parents and medical advisers who fear their young men are excited and curious about sexual matters, or that they may be acquiring the morbid knowledge that may lead to vicious and depraved habits.

Typhoid Fever and Creameries.—Some English journals are discussing the danger of the spread of typhoid fever by means of creameries. These are establishments to which many farmers bring milk, which is then mixed, skimmed by centrifugal machines, and the cream made into butter. It is well known that the addition of a small amount of infected material to a large volume of milk or other nutritive fluid is followed by rapid and extensive multiplication of the pathogenetic bacteria; hence, if a single lot of only a few quarts is infected, a wide distribution of disease may take place. The suggested danger is well worth noting, and is another argument for farm-inspection and an indication that the mere analytic control of milk is of minor importance.

Medical Martyrs.—The list of medical men whose lives have been sacrificed in the pursuit of their profession is a long and constantly growing one. One of the most recent additions is that of a young French physician named Masson, who, having been called upon to attend a poor family attacked with typhoid fever, and situated amidst squalid and filthy surroundings, with no one to minister to their needs, himself undertook the task of caring for the patients. He succeeded in making them fairly comfortable, but was attacked with typhoid fever and died. Cases of not dissimilar character must be familiar to many, both within and without the medical profession.

SELECTIONS.

THE BUCCILINGUAL FRAGMENT.

FOR many years it has appeared to the general public that this institution, founded by a man like Ezra Cornell and largely saved by a man like Henry W. Sage, has been conducted by and in the interests of a gigantic sporting fraternity, comprising about one-fourth of all the students. Among them are good men and earnest scholars. Among them also are evidently some who accept the doctrine recently enunciated by the President of Princeton: "I appreciate scholarship as much as anyone, but realize the fact that all of those who go to college do not desire to become fine scholars." From their ostensible vocation, study, they find time for numerous avocations, more or less laudable in themselves, but seldom conducive to scholarship. They are preeminently the patrons of inter-collegiate athletics, not so much by playing themselves as by attending games and, until perhaps very recently, betting upon the results. They commonly have plenty of money, not often self-acquired. They contribute liberally to athletic funds; they also, however, demand that others should do the same. They clamor for aid from the antipathetic in paying the salary of a professional trainer, and in the same term spend what would pay that salary many times over for the luxury of witnessing games in distant cities. They convert the college papers into sporting gazettes. They claim to represent the institution before the public. They assume to constitute the "student body," whereas they are merely a buccilingual fragment thereof.—*Prof. B. G. Wilder, of Cornell University.*

CONGRESS AND A NATIONAL BUREAU OF HEALTH.

THE report which the Committee on National Quarantine made to the Academy of Medicine concerning their efforts to get Congress to pass a law establishing a National Bureau of Health furnishes a striking commentary upon Congressional methods. A bill was prepared which received the approval of the medical press, the leading medical authorities, boards of trade, chambers of commerce, the chief newspapers, in short, of the entire body of intelligent and expert opinion of the country; yet the committee which had it in charge could not be induced to report it. One would think that with such an impressive body of public opinion in favor of a a bill the members of the committee would be glad to do all they could to hasten its passage; but scarcely one of them showed the slightest interest in it. What was the reason? We presume that the chief reason was political, and that there was at Washington last year, as there has been every year before since this subject was first broached, a powerful "pull" in favor of the perpetuation of the present quarantine system at New York. That "pull" ought not to be good after January 1st, but we presume it will be useless to hope for any action during this short session. The new Congress ought to show itself more amenable to reason, and ought to be willing to grant the passage of a measure which is in the interest of the health of the whole country.—*N. Y. Evening Post.*

REVIEWS.

A SYSTEM OF GENITO-URINARY DISEASES, SYPHILOLOGY, AND DERMATOLOGY. By VARIOUS AUTHORS. Edited by PRINCE A. MORROW, A.M., M.D., etc. With illustrations. Vol. iii. Dermatology. 8vo., pp. 976. New York: D. Appleton & Co. 1894.

THE third and concluding volume of this work is fully equal in style and appearance, as well as in the quality of the matter contained in its pages, to those which have preceded it. Its subject is one which has been greatly extended by modern research. The editor says in his preface: "A comparison of the table of contents of this volume with that (*sic*) of the text-books on dermatology of a few years ago will show that no fewer than forty diseases are now recognized as clinical entities which were then unknown or identified with other dermatoses."

The classification adopted is practically that of Hebra as modified by Crocker. Perhaps this is as available as any; but it is not without its defects. We find placed among the inflammations a number of disorders in which inflammatory phenomena are by no means essential, but are sometimes almost or altogether wanting, such as varicella, variola, and vaccinia. Herpes should, in our opinion, rank with the neuroses, as should also symmetrical gangrene (Raynaud's disease). And we believe that affections of coccidian origin might properly be placed among those recognized as parasitic.

The material of the article on feigned skin-diseases would be more appropriately, we think, distributed throughout the work in connection with the diagnosis of the special disorders which may be counterfeited.

The authors, twenty-seven in number, have presented the subjects allotted to them in a readable form and in accordance with the generally accepted views of the day. We feel constrained, however, to say that the book, as a whole, is not one adapted for the use of beginners in dermatology, or as a work of reference. It is not in any sense exhaustive or encyclopedic. For physicians who have had some opportunities for the study of diseases of the skin it will serve well as a guide for further reading and investigation.

A very interesting article on leprosy is contributed by the editor, who has had unusual advantages for observation of this disease during a visit paid by him to the Sandwich Islands.

A more uniform and complete system of bibliographic references would have added much to the value of this work. So also would a table of formulæ for the various remedies spoken of in the text. Thus, Lassar's paste (composed of salicylic acid, zinc oxid, powdered starch, and vaselin) is mentioned repeatedly, but we have been unable to find that the formula for it is anywhere stated.

The index is very imperfect. Sometimes the synonyms are given, sometimes omitted altogether. For example, under "hydroa" we are referred to a very brief article on p. 204, chiefly devoted to one form of the disease—the *hydroa puerorum* of Unna; but we are not referred to p. 166, where the term appears as a synonym of dermatitis herpetiformis, and is much more important.

As a rule, the illustrations are remarkably good. We venture to hope that in another edition they may be extended so as to include representations of the microorganisms which play so prominent a part in many of the affections described.

PHYSIOLOGY FOR BEGINNERS. By M. FOSTER, M.A., M.D., F.R.S., and LEWIS E. SHORE, M.A., M.D. New York and London: MacMillan & Co., 1894.

THERE was a time, not so very long ago, when the furnishing of text-books in American schools was let out by the job-lot to some one publishing firm which had the necessary political pull, and the professional school-book writer was very much in evidence, ready to write a book on any subject, no matter how foreign to him. Within the last few years a desire for a higher grade of books for school-children has been slowly cultivated, and men of recognized standing in their respective branches are engaged to write such books. Unfortunately the university professor, following his own special line of research, is not always able to descend from his lofty pedestal, from which he lectures to mature men or women, to the needs and comprehensions of small children, and thus it happens that what he writes, in spite of his thorough knowledge of the subject, is not best adapted for primary schools; he arranges the matter treated in the same manner as he presents it to his own students, and not according to the methods of the so-called new education now followed by all competent teachers. Prof. Foster's little book is excellently written and in its present form a very valuable guide for teachers who know the subject thoroughly; but if the different chapters would be rearranged by some up-to-date school-teacher well versed in modern educational methods, and a good complete glossary added to each, the book would increase in value tenfold, and really be a "physiology for beginners," which it is not in its present form. Modern education demands that instruction should proceed from the known to the unknown, that there should be a thought in the child's mind upon which the teacher can build another thought, and a university professor is too prone to forget that a young child, a beginner in the fullest sense of the word, has only one definite and tangible thought in relation to physiology, and that is *food*, not blood, not chemic action.

PRACTICAL URINALYSIS AND URINARY DIAGNOSIS: A MANUAL FOR THE USE OF PHYSICIANS, SURGEONS, AND STUDENTS. By CHARLES W. PURDY, M.D., Queen's University; Fellow of the Royal College of Physicians and Surgeons, Kingston; Professor of Urology and Urinary Diagnosis at the Chicago Post-Graduate Medical School; author of *Bright's Disease and Allied Affections of the Kidneys;* also of *Diabetes: Its Causes, Symptoms, and Treatment.* With numerous illustrations, including photo-engravings and colored plates. 8vo., pp. xiv, 351. Philadelphia: The F. A. Davis Co., 1894.

THE time has passed when it was necessary to emphasize the importance of a study of the urine for diagnostic purposes. Perhaps even in a greater degree than physical examination, investigation of the urine is made as a routine practice—for there is danger in resorting to urinalysis only when the symptoms or the very obscurity of a diagnosis suggests such an examination. This contribution of Dr. Purdy's is a useful addition to the literature of urinary examination. It is well and intelligently written, and while taking cognizance of new tests, indorses only those that practical experience has shown to be reliable. The arrangement is a convenient and logical one. The various constituents of the urine, both normal and abnormal are considered successively as to their chemic nature and composition, their source in the economy, the significance of their increase or decrease, the relation of these changes to metabolic processes, food-supply, physical surroundings and tendency toward disease, with the most approved methods of detection and determination. Finally, a concise description is given of the special features of the urine that indicate the existence of special pathologic processes in the economy, together with a brief enumeration of the principal symptoms of each disease, and reference to their nature and etiology. The book is well printed and well made,

and measurably free from error. By a strange perversion, the compositor has insisted upon spelling urinalysis "uranalysis."

ATTFIELD'S CHEMISTRY. NEW (14TH) EDITION. CHEMISTRY, GENERAL, MEDICAL, AND PHARMACEUTICAL. By JOHN ATTFIELD, M.A., PH.D., etc., Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain, etc. Fourteenth edition, specially revised by the Author for America to accord with the new U. S. Pharmacopeia. Royal 12mo, 794 pages, 88 illustrations. Philadelphia: Lea Brothers & Co., 1894.

WITH a work so long in favor and so widely known as this, the reviewer can do little else than chronicle from time to time successive editions. The present edition maintains the merits of the work and adheres to the arrangement of subjects that have been so long characteristic of it. It was hardly to be expected that an English chemist would adopt the American spelling of chemic terms, especially in view of the attitude of the present pharmacopeia, but it is certainly to be regretted that reforms in the nomenclature which have been officially advised by an international convention and long adopted by both English and American chemists should be wholly ignored. We find, for instance, "hydrate" used for "hydroxid," "glycerin" for "glycerol," "resorcin" for "resorcinol." We note also the spelling "albumen," instead of "albumin." It certainly seems strange that so able a chemist should persist in using the termination "en," which has no significance in chemistry, in the face of the employment of "in" for all analogous bodies. Albumin is of course classed by our author with casein, fibrin, etc., yet he does not seem to see the incongruity of using a different termination. This is all the more serious because the term "albumen" has a specific meaning in biology.

The work exhibits the excellence in printing and care in proof-reading that are usual with this publishing firm. It will no doubt find ready acceptance, and it will be the duty of the reviewer at no distant period to chronicle the appearance of the fifteenth edition, in which we hope to see some evidence of the effect of the leaven of spelling reform.

SAUNDERS' QUESTION COMPENDS. NO. 24. ESSENTIALS OF THE DISEASES OF THE EAR. ARRANGED IN THE FORM OF QUESTIONS AND ANSWERS. PREPARED ESPECIALLY FOR STUDENTS OF MEDICINE AND POST-GRADUATE STUDENTS. By E. B. GLEASON, S.B., M.D., Clinical Professor of Otology, Medico-chirurgical College, Philadelphia. Surgeon in charge of the Nose, Throat and Ear Department of the Northern Dispensary, Philadelphia. Philadelphia: W. B. Saunders, 1894.

THIS little work is up to the standard of this compend series, yet it is a mistake to occupy too much space in a book of this size with cuts of apparatus and structures with which even the student is familiar. The section devoted to rhinoscopy is good; the same can be said of the portion treating of diseases of the middle ear. In dividing the space for the subjects treated it seems scarcely necessary to devote almost one-seventh of the book to the anatomy of the ear. The illuminating headlight, given as that of the author, is good, yet it is only a modification of the now common electric headlights used. The Hirschmann light answers the same purpose and is practically the same. The book covers pretty thoroughly the subject, and while not presenting much that is new, yet the author's questions are to the point, and his answers are clear and concise.

TEXT-BOOK OF MEDICAL AND PHARMACEUTICAL CHEMISTRY. By ELIAS H. BARTLEY, B.S., M.D., Professor of Chemistry and Toxicology in Long Island College Hospital, etc. Third edition, revised and enlarged, with 84 illustrations. Octavo, pp. 684. Philadelphia: P. Blakiston, Son & Co., 1894.

CHEMIC knowledge must be gained in the laboratory. The teacher and the text-book can only help the student in his studies. Among thoroughly helpful text-books the one before us deserves high commendation, and the fact that it has reached a third edition shows that its value is appreciated. The preliminary sections on physics, the concluding sections on digestion and excretions, with tests for stomach-contents, urine, and feces, add much to its usefulness to students and to physicians. A glossary and a good index complete the list of its merits.

CORRESPONDENCE.

GUAIACOL TOPICALLY AS A PROPHYLACTIC AGAINST DIPHTHERIA.

To the Editor of THE MEDICAL NEWS,

SIR: While admitting the difficulty of estimating the true value of an agent used as a preventive against an infectious disease, I desire to urge upon the profession the topical application of guaiacol as a possible—yes, a probable—prophylactic against diphtheria in the cases of attendants upon diphtheria-patients, and of children and others residing in the same house with diphtheria-patients.

If an excessive quantity is not used, guaiacol may be applied harmlessly, in full strength, even to the throats of children; but for children it is, I think, best to dilute it one-half or two-thirds, according to the age of the child, with olive-oil or liquid petrolatum. Very sensitive throats may be previously touched or sprayed with a solution of cocain (from 2 per cent. to 5 per cent.).

The guaiacol, which should be a pure preparation (Merck's is reliable), is best applied with cotton wad, and by quick motion, first to one tonsil, immediately afterward to the other tonsil, and after an interval of two or three minutes to the pharynx. Some burning or smarting is caused by each application. This, however, passes off in the course of a minute or two, or, if unexpectedly severe, may be relieved by ice or iced water. Latterly I have used as a diluent for guaiacol a five per cent. solution of menthol in liquid petrolatum, and the peculiar cooling effect of the inhalation of air after the use of mint seemed to be an advantage. There is no caustic or escharotic effect from pure guaiacol. Impure preparations cause an undesirable eschar more or less opalescent according to the character of the impurity.

The application may be repeated daily or at longer intervals, or not at all, according to circumstances.

Very truly yours,

SOLOMON SOLIS-COHEN.

819 S. SEVENTEENTH ST., PHILADELPHIA.

NEWS ITEMS.

Charcot Memorial.—The pupils and former associates of Charcot in Paris and throughout France are engaged in raising a fund for the erection of a bronze statue of the great neurologist in the Salpêtrière. This movement is now receiving cordial and material support in Germany, in England, and in Italy, as well, of course, as in France.

It has therefore seemed desirable to the Neurological Societies of New York and Philadelphia that the profession in America should join in this testimonial as a tribute to the eminent services of Charcot in neurology and medicine.

For this purpose a committee has been appointed to bring the matter to the attention of the profession and to receive contributions, which will be duly acknowledged and forwarded to the central committee in Paris.

All who desire to contribute to the success of this undertaking are requested to send their subscriptions to the members of the committee nearest them or directly to the treasurer, Dr. C. A. Herter, 819 Madison Avenue, New York, before the first day of February, 1895. The committee is constituted as follows:

For New York: E. D. Fischer, M.D., E. C. Seguin, M.D., M. A. Starr, M.D., C. L. Dana, M.D., C. A. Herter, M.D.

For Philadelphia: S. Weir Mitchell, M.D., Wharton Sinkler, M.D., Chas. K. Mills, M.D.

For Boston: J. J. Putnam, M.D., P. C. Knapp, M.D.

For Baltimore: William Osler, M.D.

For Chicago: Archibald Church, M.D.

For St. Louis: C. H. Hughes, M.D., F. R. Fry, M.D., L. Bremer M.D.

For Montreal, Canada: James Stewart, M.D.

For Rochester: E. B. Angell, M.D.

For Buffalo: J. W. Putnam, M.D.

For Pittsburg: Theodore Diller, M.D.

For Denver: Howell T. Pershing, M.D.

For San Francisco: J. D. Hirschfelder, M.D.

The Philadelphia Neurological Society has voted the sum of $150 as its contribution to the contemplated memorial to Charcot.

Dr. St. John W. Mintzer, who rendered good professional service during the Civil War and who for a time resided and practised medicine in Philadelphia, died on December 26, at his home, China Hall, Bucks County, after a protracted illness, at the age of sixty-two years.

The Dominion Medical Monthly.—Dr. W. H. B. Aikins has withdrawn from the publication of the *Dominion Medical Monthly*, and Drs. J. H. Burns, John Ferguson, G. Sterling Ryerson, A. B. Atherton, and Albert A. MacDonald from the collaborating staff.

F. A. Fluckiger, the distinguished pharmacologist, died recently at Berne, at the age of sixty-six years. His contributions to materia medica and pharmacology were numerous and valuable.

Prof. K. Weil has been made Professor of Surgery in the German University of Prague, in succession to Gussenbauer, elected to the chair formerly occupied by Billroth.

A Special Course in Regional Surgery was begun at the Masonic Hospital of Chicago, by Dr. G. Frank Lydston on January 7th, and will be continued on subsequent Mondays, on the following subjects: "Surgery of the Prostate, Bladder, and Kidneys, including Calculus;" "Appendicitis;" "Surgery of the Rectum and Urethra;" "Varicocele." The course is open to members of the medical profession.

BOOKS AND PAMPHLETS RECEIVED.

Third Annual Message of Edwin S. Stuart, Mayor of the City of Philadelphia, with Annual Report of the President of the Department of Charities and Correction. For the Year ending December 31, 1893. Philadelphia: Dunlap Printing Co., 1894.

Paralysis of the Eye-Muscles of Central and Peripheral Origin. By A. Friedenwald, M.D. Reprinted from the Maryland Medical Journal, 1894.

Beri-beri, with Report of Cases. By J. M. Anders, M.D., Ph.D. Reprinted from the Medical Bulletin, 1894.

The Treatment of Erysipelas. By J. M. Anders, M.D., Ph.D. Reprinted from the Therapeutic Gazette, 1894.

L'Ichthyol dans le Traitement des Urethrites et des Cystites. Par le Dr. Roberto Villetti. Pamphlet. Rome: Imprimerie Innocenzo Artero, 1894.

Ueber die Anwendung des Ichthyol bei Wunddruck der Füsse. Von Dr. Leopold Herz. Aus dem Aerztlichen Central-Anzeiger, 1894.

Psorospermosis Cutis. Von Dr. A. Ravogli. Sonder-Abdruck aus Monatschefte für Praktische Dermatologie, 1894.

Pregnancy after Ventral Fixation of the Uterus. A Report of Four Cases. By George M. Edebohls, M.D. Reprinted from the Transactions of the New York Obstetrical Society, 1894.

Rheumatic Conjunctivitis. By A. L. Hodgdon, M.D. Reprinted from the Maryland Medical Journal, 1894.

Some Reasons for the Performance of Circumcision on all Male Infants. By A. L. Hodgdon, M.D. Reprinted from the American Medico-Surgical Bulletin, 1893.

Diagnostic Palpation of the Appendix Vermiformis. Cases of Appendicitis. By George M. Edebohls, A.M., M.D. Reprinted from the American Journal of the Medical Sciences, 1894.

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